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Vol. 1054 Number 3

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UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

May 21, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

May 21, 1985 Volume 1054 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 25/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

Note that the amount of the international search fee for the European Patent Office was changed effective May 7, 1985 and the amounts of the International PCT fees will change effective May 28, 1985. For information on these fee changes see the notice appearing in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	No charge

May 6, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 18, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,329,741 through 4,330,886

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,922,377, Re. S.N. 719,969, Filed Apr. 4, 1985, Cl. 426/645, HEAT-PROCESSED DEHYDRATED BACTERIOLOGICALLY-STABLE PORK RIND PROD-

UCT AND PROCESS FOR PREPARING SAME, Kenneth F. Whittle, Owner of Record: *Protein Foods (U.K.) Ltd., Staffordshire, England,* Attorney or Agent: Richard E. Fichter, Ex. Gp.: 132

4,291,391, Re. S.N. 672,854, Filed Nov. 19, 1984, Cl. 365/184, TAPER ISOLATED RANDOM ACCESS MEMORY ARRAY AND METHOD OF OPERATING, Pallab K. Chatterjee, et al., Owner of Record: *Inventors,* Attorney or Agent: Melvin Sharp, Ex. Gp.: 233

4,302,893, Re. S.N. 709,345, Filed Mar. 6, 1985, Cl. 037/066, DIGGING WHEEL FOR A SUCTION DREDGER VESSEL, Johannes van den Elshout, et al., Owner of Record: *IHC Holland N.V., Papendrecht, Netherlands,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 337

4,308,707, Re. S.N. 716,065, Filed Mar. 26, 1985, Cl. 053/314, CLOSURE PRE-TIGHTENER FOR CLOSURE APPLICATING MACHINES, Wendell D. Willingham, Owner of Record: *Owens-Illinois, Inc., Toledo, Ohio,* Attorney or Agent: John R. Nelson, et al., Ex. Gp.: 327

4,355,697, Re. S.N. 704,160, Filed Dec. 24, 1984, Cl. 180/261, A VEHICULAR STEERING AND SUSPENSION SYSTEM, Nicolae V. Orlandea, et al., Owner of Record: *Deere & Co., Moline, Ill.,* Attorney or Agent: R. L. Hollister, et al., Ex. Gp.: 316

4,375,864, Re. S.N. 707,698, Filed Mar. 4, 1985, Cl. 222/081, CONTAINER FOR HOLDING AND DISPENSING FLUID, Chester Savage, Owner of Record: *Scholle Corp., Irvine, Calif.,* Attorney or Agent: Louis J. Knobbe, et al., Ex. Gp.: 311

4,377,157, Re. S.N. 714,622, Filed Mar. 21, 1985, Cl. 128/IR, INTRAVAGINAL ANCHORING DEVICE, David L. Zartman, Owner of Record: *New Mexico State University Foundation, Inc., Las Cruces, N.M.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 335

4,378,162, Re. S.N. 716,719, Filed Mar. 27, 1985, Cl. 366/007, PROCESS FOR MAKING ASPHALT CONCRETE, Paul E. Bracegirdle, Owner of Record: *Inventor,* Attorney or Agent: Ronald L. Panitch, et al., Ex. Gp.: 242

4,423,140, Re. S.N. 719,840, Filed Apr. 4, 1985, Cl. 430/445, SILVER HALIDE EMULSIONS CONTAINING AROMATIC LATENT IMAGE STABILIZING COMPOUNDS, Arthur H. Herz, Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 156

4,452,685, Re. S.N. 719,795, Filed Apr. 3, 1985, Cl. 204/252, ELECTRODES FOR ELECTROLYTIC CELLS, Kenneth E. Woodard, Jr., et al., Owner of Record: *Olin Corp., New Haven, Conn.,* Attorney or Agent: Ralph D'Alessandro, et al., Ex. Gp.: 112

4,472,600, Re. S.N. 714,457, Filed Mar. 21, 1985, Cl. 179/7.1R, CHARGE TIME START CONTROL FOR INTERCONNECT PABX, Murray F. Kaminsky, Owner of Record: *RCA Corp., New York, N.Y.,* Attorney or Agent: Joseph S. Tripoli, et al., Ex. Gp.: 261

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,548,373, Reexam. No. 90/000,755, Requested: Apr. 10, 1985, Cl. 340/64, THEFT PREVENTING SYSTEM FOR VEHICLES, Aureo Rivera, et al., Owner of Record: *Aureo & Aureo E. Rivera, Bayamon, P.R.,* Attorney or Agent: O'Brien & Jacobson, Ex. Gp.: 260 Requester: Chapman Ind. Corp., Elk Grove Village, Ill.

3,732,647, Reexam. No. 90/000,756, Requested: Apr. 11, 1985, Cl. 51/54, POLISHER FINER MACHINE, Joe D. Smith, Owner of Record: *Coburn Manufacturing Co., Inc., Muskogee, Okla.,* Attorney or Agent: John J. Burne, Ex. Gp.: 323 Requester: Coburn Optical Industries, Inc., Washington, D.C.

3,984,329, Reexam. No. 90/000,759, Requested: Apr. 12, 1985, Cl. 210/396, DEVICE FOR EXTRACTING LIQUID FROM SLUDGE, Lothar Wenzel, et al., Owner of Record: *Firma Gebruder Bellmer, KG, Niefern, Germany,* Attorney or Agent: Joseph A. Geiger, Ex. Gp.: 136, Requester: Arus-Andritz, Inc., Arlington, Tex.

4,117,248, Reexam. No. 90/000,758, Requested: Apr. 15, 1985, Requester: 568/855, CONTINUOUS, LOW PRESSURE ETHYNYLATION PROCESS FOR THE PRODUCTION OF BUTYNEDIOL, J. Lewis Prater, et al., Owner of Record: *GAF Corp., New York, N.Y.,* Attorney or Agent: W. C. Kehm, Ex. Gp.: 126, Requester: E. I. Du Pont de Nemours & Co., Wilmington, Del.

4,181,419, Reexam. No. 90/000,757, Requested: Apr. 12, 1985, Cl. 354/286, INTERCHANGEABLE LENS FOR SLR-CAMERAS HAVING TTL LIGHT METERING, Werner Schlapp, et al., Owner of Record: *Ernst Leitz Wetzlar, Wetzlar, Germany,* Attorney or Agent: Schwartz, Jeffery, et al., Ex. Gp.: 210, Requester: Owner

4,491,088, Reexam. No. 90/000,760, Requested: Apr. 16, 1985, Cl. 119/72.5, WATERING SYSTEM FOR FOWL AND SMALL ANIMALS, Eldon Hostetler, Owner of Record: *Ziggity Systems, Inc., Middlebury, Ind.,* Attorney or Agent: David R. Melton, Ex. Gp.: 333, Requester: Val Watering Systems and/or Valorbs Jewel, Annandale, Va.

Errata

"All reference to the Reexamination Certificate for the Certificate No. B1 3,963,842 to Sivertz for 'DEPOSITION OF COPPER' appearing in the Official Gazette of Apr. 16, 1985, should be deleted since no certificate was issued."

"All reference to Patent No. 4,514,239 to H. William Voigt, et al., of N.J. for 'PRODUCTION OF FINE CRYSTALLINE TNT COMPOSITIONS' appearing in the Official Gazette of Apr. 30, 1985 should be deleted since no patent was granted."

"All reference to Patent No. 4,514,610 to Roderich Keller, et al., of Federal Republic of Germany for 'HIGH CURRENT ION SOURCE' appearing in the Official Gazette of Apr. 30, 1985 should be deleted since no patent was granted."

Errata

Trademark Application Serial No. 191,523 was inadvertently issued in the "Index of Registrants" section of the Trademark Official Gazette of Mar. 24, 1981, as follows:

TMI 8 TMOG March 24, 1981
Home Tech, Inc.,
Bethesda, Md.
Registration No. 1,148,896

Consequently, the above-identified registration number is cancelled.

The above-identified Trademark Application Serial No. 191,523 was correctly listed as issued in the "Index of Registrants" section of the Trademark Official Gazette of June 16, 1981, as follows:

TMI 4 TMOG June 16, 1981
Home Tech, Inc.,
Bethesda, Md.
Registration No. 1,157,662

Consequently, Registration No. 1,157,662 is still active.

PATRICIA M. DAVIS
Mar. 15, 1985. *Administrator for Trademarks.*

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name:
SUPREME IMPORT EXPORT CO., INC."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Application for Recordation of Trade Name
Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "SUPREME IMPORT EXPORT CO., INC." used by Supreme Import Export Co., Inc., a corporation organized under the laws of the State of New York, located at 900 Broadway, New York, N.Y. 10003.

The application states that the trade name is used in connection with the following merchandise manufactured in Hong Kong, Korea, Japan, Taiwan and the Philippines: playing cards; cigarette lighters; cellophane tape; toothbrushes; padlocks; cassette tapes; pens; batteries; sunglasses; cameras and curling irons.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.
Date: Comments must be received on or before May 13, 1985.
Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

EDWARD T. ROSSE,
Mar. 8, 1985. *Acting Director, Entry Procedures and Penalties Division.*

Department of the Treasury
United States Customs Service
(T.D. 85-42)
Recordation of Trade Name:
"GERBER PRODUCTS CO"

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Recordation
Summary: On Dec. 17, 1984, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "GERBER PRODUCTS CO." was published in the Federal Register (49 FR 49014). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than Feb. 15, 1985. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "GERBER PRODUCTS CO." is recorded as the tradename used by Gerber Products Co., a corporation organized under laws of the State of Michigan, located at 445 State St., Fremont, Mich. 49412. The trade name is used in connection with plush toys, crib toys and other merchandise intended for use by infants and small children, manufactured in Hong Kong, Taiwan, Malaysia, West Germany, Japan and Thailand.
Date: Mar. 14, 1985.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

EDWARD T. ROSSE,
Mar. 8, 1985. *Acting Director, Entry Procedures and Penalties Division.*

Department of the Treasury
U.S. Customs Service
(T.D. 85-24)
Recordation of Trade Name:
"THE UNION FORK AND HOE CO."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Recordation
Summary: On Nov. 15, 1984, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "THE UNION FORK AND HOE CO.," was published in the Federal Register (49 FR 45288-45289). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than Jan. 14, 1985. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "THE UNION FORK AND HOE CO." is recorded as the trade name used by the Union Fork and Hoe Co., a corporation organized under the laws of the State of Ohio, located at 500 Dublin Ave., Columbus, Ohio 43216. The trade name is used in connection with hand-operated farm, garden and lawn tools manufactured in the United States.
Date: Feb. 19, 1985.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Feb. 13, 1985. *Director, Entry Procedures and Penalties Division.*

PATENT NOTICES

Certificates of Correction for the Week of May 21, 1985

Re.31,692	4,451,455	4,476,339	4,487,673
3,621,872	4,451,886	4,476,425	4,487,772
4,066,653	4,452,367	4,476,550	4,487,808
4,218,477	4,452,793	4,477,501	4,487,866
4,261,867	4,454,221	4,478,731	4,487,913
4,322,223	4,457,789	4,478,787	4,487,915
4,323,217	4,458,227	4,478,852	4,487,997
4,325,404	4,459,225	4,479,030	4,488,208
4,362,760	4,460,533	4,479,125	4,488,348
4,369,242	4,463,227	4,480,069	4,488,385
4,376,775	4,463,349	4,481,111	4,488,686
4,379,528	4,464,069	4,481,384	4,488,892
4,393,317	4,464,336	4,481,498	4,488,893
4,399,997	4,465,662	4,481,539	4,489,150
4,400,568	4,465,913	4,481,902	4,489,198
4,401,596	4,466,246	4,481,941	4,489,206
4,408,676	4,466,615	4,481,962	4,489,446
4,408,903	4,466,906	4,482,221	4,489,573
4,415,484	4,467,382	4,482,378	4,489,617
4,419,298	4,469,513	4,482,575	4,489,679
4,421,654	4,470,065	4,483,120	4,490,226
4,422,869	4,470,292	4,483,312	4,490,251
4,424,115	4,470,757	4,483,686	4,490,361
4,424,963	4,470,789	4,483,742	4,490,475
4,425,616	4,470,812	4,483,782	4,490,478
4,426,696	4,471,400	4,483,835	4,490,567
4,431,495	4,471,732	4,484,571	4,490,685
4,432,854	4,471,893	4,484,723	4,490,810
4,432,942	4,472,199	4,485,427	4,491,115
4,434,022	4,472,282	4,485,474	4,492,192
4,434,141	4,472,397	4,486,112	4,492,335
4,438,950	4,472,805	4,486,282	4,492,764
4,440,123	4,473,469	4,486,291	4,493,363
4,440,736	4,474,238	4,486,336	4,493,701
4,440,906	4,474,508	4,486,914	4,495,319
4,442,298	4,475,234	4,487,096	4,495,958
4,444,800	4,475,689	4,487,233	4,496,749
4,446,045	4,475,943	4,487,309	
4,446,132	4,475,955	4,487,323	
4,447,738	4,476,031	4,487,335	

Disclaimers

4,199,574.—*Howard J. Schaeffer,* Richmond, Va. METHODS AND COMPOSITIONS FOR TREATING VIRAL INFECTIONS AND GUANINE ACYCLIC NUCLEOSIDES. Patent dated Apr. 22, 1980. Disclaimer filed Mar. 22, 1985, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,247,962.—*Charles P. Hall,* Muir Beach, Calif. WAVELESS WATERBED MATTRESS. Patent dated Feb. 3, 1981. Disclaimer filed Oct. 12, 1984, by the assignee, *Monterey Manufacturing Co.*

Hereby enters this disclaimer to claims 10 and 11 of said patent.

4,283,989.—*Peter P. Toulios,* Oakbrook; and *Kenneth D. Hartman,* DeKalb, Ill. DOPPLER-TYPE PROJECTILE VELOCITY MEASUREMENT AND COMMUNICATION APPARATUS, AND METHOD. Patent dated Aug. 18, 1981. Disclaimer filed Mar. 25, 1981, by the assignee, *Ares, Inc.*

Hereby enters this disclaimer to all claims of said patent.

Dedication

3,885,626.—*Walter W. Gale,* Houston; *Thomas L. Ashcraft, Jr.;* and *Rhoderick K. Saunders,* Baytown, Tex. OIL RECOVERY PROCESS UTILIZING HIGHER ALKYL TOLUENE SULFONATE. Patent dated May 27, 1975. Dedication filed Feb. 28, 1985, by the assignee, *Exxon Production Research Co.*

Hereby dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
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Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 13, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-12-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-28-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-03-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-20-81
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-1-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-20-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-05-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-26-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-21-83

Expiration of patents: The patents within the range of numbers indicated below expire during April 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,375,529 to 3,381,302, inclusive

Plant Patents ..... Numbers 2,802 to 2,810 inclusive

REISSUES

MAY 21, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,889
HEAT EXCHANGER

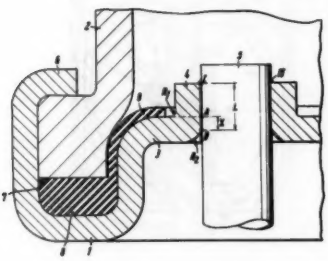
Manfred Nonnenmann, Schwieberdingen, and Helmut Bardong, Stuttgart, both of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr, Stuttgart, Fed. Rep. of Germany

Original No. 4,305,459, dated Dec. 15, 1981, Ser. No. 114,649, Jan. 23, 1980. Continuation of Ser. No. 518,147, Oct. 25, 1974, abandoned. Application for reissue Jun. 9, 1983, Ser. No. 502,749

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1973, 2353442; May 31, 1974, 2365476

Int. Cl.³ F28F *9/16*

U.S. Cl. 165—173 **12 Claims**



8. A solderless heat exchanger comprising:

a header compartment having a substantially planar wall having upper and lower surfaces, wherein at least one passage is formed in said wall comprising a portion of said wall in which the entire thickness of the wall is bent to define a curved portion and an internal cylindrical portion of said wall, said curved portion merging into said internal cylindrical portion along a line of intersection extending about said passage;

a finned tube passing through said wall and being seated in said passsage by expansion of said tube such that said tube is surrounded by and contacts said internal cylindrical portion of said wall, and wherein the line of intersection of said curved portion with said internal cylindrical portion occurs at a point B lying between planar extensions, at said tube, of said upper and lower surfaces of said header compartment wall.

Re. 31,890
FREEZING MOULD BAG

Erling Vangedal-Nielsen, Kirke Vaerloesevej 67, DK-3500, Vaerlose, Denmark

Original No. 4,181,285, dated Jan. 1, 1980, Ser. No. 872,023, Jan. 24, 1978. Application for reissue Aug. 20, 1981, Ser. No. 294,804

Claims priority, application Denmark, Jan. 25, 1977, 309/77

Int. Cl.³ B28B *7/34, 7/06*

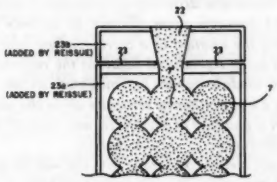
U.S. Cl. 249—61 **25 Claims**

1. A disposable freezing mould bag for receiving and retaining therein liquid to be frozen into a plurality of objects suitable for human consumption, and for being destroyed to gain access to the frozen objects, the mould bag comprising: first and second generally rectangular opposed sheets of thin and flexible [plastics] *plastic* material defining the walls of the mould bag, said opposed sheets having top edges, bottom edges and side edges, and being flat and lying in contact with one another prior to the bag being filled with liquid; said first and second opposed sheets being heat sealed at a plurality of positions spaced over selected portions of the sheets, with the exception of defined unsealed portions for receiving the liquid to be frozen;

the unsealed portions in a lower generally rectangular portion of the bag defining a plurality of interconnected compartments of substantially the same configuration, the compartments being interconnected by channels of reduced cross-sectional area, the walls of the compartments being defined by said opposed sheets, and being in substantial contact with each other prior to filling of the bag and each being distended away from the other by the liquid to be frozen after filling of the bag, said first and second opposed sheets being of a thickness so as to be rupturable at said unsealed compartments to facilitate removal of the frozen objects from the bag; [and]

the unsealed portions in an upper generally rectangular portion of the bag defining a *central* filling channel *having side edges substantially equally spaced from a filling channel axis and from side edges of the bag and* extending from *an opening at* the top edge of the bag to at least one of said compartments so that liquid entering the opening of said filling channel flows into, distends, and fills all of the compartments; *and*

cuts formed in an area of the bag immediately above the compartments in the lower portion of the bag, the cuts extending inwardly from each of the side edges of the bag and terminating at points spaced outwardly of the side edges of the filling



channel so that first and second substantially rectangular upper portions are defined between said cuts and the top edges of said first and second opposed sheets, the upper portions being positioned on respective sides of said filling channel and extending transversely outwardly relative to the axis of the filling channel to the opposite side edges of the sheets, said upper portions extending in the direction of said filling channel axis between a first transverse plane passing through the opening of said filling channel and a second transverse plane spaced from said first transverse plane along the filling axis and passing through said cuts in the area immediately above the compartments, said outwardly extending first and second upper portions being foldable downwardly along transverse folding lines to define opposed wing means separate from the lower portion of the bag containing the compartments, said wing means being sufficient in transverse length to permit the wing means to be tied together in a knot so that the tied wing means completely close the filling channel once the bag is filled with liquid to be frozen;

said bag being flat when unfilled, adapted to receive liquid through said filling channel to all of said compartments to bulge the walls of the compartments due to the presence of the liquid, and *adapted* to form a frozen mass defined by all of said compartments and unsealed channel areas therebetween, said frozen mass in the channels between compartments being readily breakable when the compartments are ruptured to gain access to the frozen objects in the compartments.

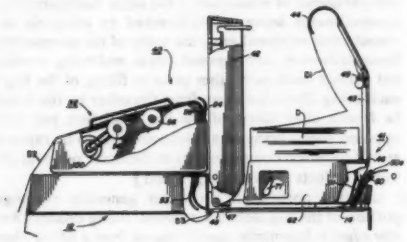
Re. 31,891
PLATEN MODULE FOR COMPUTER FANFOLD REPRODUCTION

Donald R. Tickner, Pittsford, and Robert E. Kalvitis, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,264,200, dated Apr. 28, 1981, Ser. No. 75,919, Sep. 17, 1979. Application for reissue Mar. 4, 1982, Ser. No. 354,684

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—75 **6 Claims**



6. In a reproduction machine having a document handling apparatus adapted to handle either individual documents, or document material in the form of a computer fanfold web consisting of a plurality of frame sections, the machine including an exposure platen on which said frame sections are positioned and a register element adjacent one side of the platen for locating an edge of each frame during copying thereof, the combination of:

a tractor assembly detachably mounted adjacent the document handling apparatus,

a tractor motor and drive thereof mounted in said tractor assembly and actuable upon the web to advance the same and effecting the location of a corresponding edge of each of the frames being reproduced adjacent the registration element,

a storage module removably mounted on the machine and having a tray positioned vertically above the platen adapted to support a quantity of the folded web thereon in readiness for the reproduction of frames therein,

a first guide means cooperable with the web for guiding the web during movement thereof from said tray, and between the same and the platen located therebelow,

a second guide means for receiving the web after the same has moved between the storage module and the platen and guiding the same to said tractor assembly and into cooperation with said tractor motor and drive for conveyance thereby.

Re. 31,892

Patent Not Issued For This Number

Re. 31,893
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroshi Sugita; Shizuo Saito, both of Hachioji; Ryosuke Sato, and Kiyoshi Yamashita, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Original No. 4,355,100, dated Oct. 19, 1982, Ser. No. 226,243, Jan. 19, 1981. Application for reissue Jul. 14, 1983, Ser. No. 513,799

Claims priority, application Japan, Jan. 16, 1980, 55-3163

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—544 **6 Claims**

1. A color photographic material having a light-sensitive silver halide emulsion layer coated on a support, which comprises

(1) a DIR compound which releases a diffusive development-inhibiting substance, said substance having an amino group, by a coupling reaction with an oxidation product of an aromatic primary amine developing agent (DIR compound (I)) and

(2) a DIR compound which releases a diffusive development-inhibiting substance, said substance having no amino group, by a coupling reaction with an oxidation product of an aromatic primary amine developing agent (DIR compound (II)).

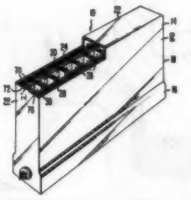
Re. 31,894
MODULAR GUIDED BEAM FLAT DISPLAY DEVICE

Kenneth D. Peters, Merritt Island, Fla., and Charles H. Anderson, Rocky Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Original No. 4,145,633, dated Mar. 20, 1979, Ser. No. 796,337, May 12, 1977. Application for reissue Apr. 17, 1980, Ser. No. 141,070

Int. Cl.³ H01J *29/46*

U.S. Cl. 313—422 **14 Claims**



1. A display device comprising

an evacuated envelope having spaced, substantially parallel front and back walls and spaced, substantially parallel support walls extending between and substantially perpendicular to the front and back walls, said support walls forming a plurality of parallel channels extending along said front and back walls,

a separable metal tip compressed between the front wall and each of said support walls and extending along the support wall, [each of said tips having a thickness at the support wall substantially equal to the thickness of the support wall and tapering to a thinner thickness at the front wall.] and

means preventing movement of each of said tips in a direction transversely of the channels so as to maintain the metal tips against the support walls.

Re. 31,895
NMR SPECTROMETER WITH SUPERCONDUCTING COIL HAVING RECTANGULAR CROSS-SECTION WIRE

George D. Kneip, Jr., Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Original No. 4,213,092, dated Jul. 15, 1980, Ser. No. 879,291, Feb. 21, 1978. Application for reissue Sep. 12, 1983, Ser. No. 485,983

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—319 **15 Claims**

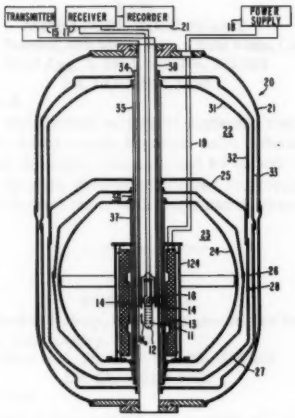
1. An NMR spectrometer for testing a sample comprising

a transmitting coil for applying an rf field to the sample,

a receiver coil coupled to the sample for deriving a signal indicative of the NMR properties of the sample,

a solenoid coil having a longitudinal axis about which the coil is wound and a central core in which said transmitting and receiver coils and said sample are positioned, said coil applying a homogeneous DC magnetic field to the sample,

said coil being formed of superconducting wire having a rectangular cross-section, said wire being formed of a non-superconducting metal having a relatively low room temperature *electrical conductivity, said* material surrounding *said* superconductor material having a small enough cross-sectional area that a magnetic field resulting from current flowing in the superconductor material has a



relatively constant location relative to the cross-section of the wire, said wire being wound as a plurality of helices each of which is concentric with the coil longitudinal aixs, immediately adjacent helices having oppositely directed pitches and faces that abut substantially against each other, adjacent turns of the same helix having faces that abut against each other.

Re. 31,896

CHART RECORDERS

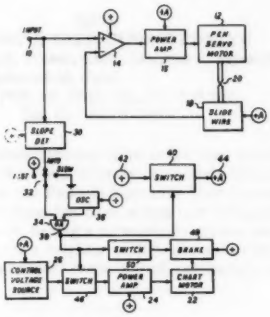
David J. Lowe, Sheffield, England, assignor to National Research Development Corp., London, England

Original No. 4,215,351, dated Jul. 29, 1980, Ser. No. 944,559, Sep. 21, 1978. Application for reissue Jan. 21, 1982, Ser. No. 400,546

Claims priority, application United Kingdom, Jun. 4, 1977, 41486

Int. Cl.³ G01D *15/24, 9/00, 15/16*

U.S. Cl. 346—136 **25 Claims**



18. A chart recorder, comprising:

an input terminal for receiving an electrical signal, a value of which is to be recorded; and

recorder circuitry connected to the input terminal, the recorder circuitry including:

first drive means for moving a length of record medium relative to a recording member; and

second drive means connected to said input terminal for relatively moving the recording member across the record medium to a position dependent on the said value of the input signal;

at least one of said drive means including a drive motor provided with a velocity control circuit comprising a memory circuit having an input connected to said motor through a first switch and an output connected to a comparator which also receives a motor control signal, the comparator output being applied to said motor through a second switch and a power amplifier, wherein said first and second switches are closed alternately.

PLANT PATENTS

GRANTED MAY 21, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,470
MINIATURE ROSE PLANT

Cecelia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 3, 1983, Ser. No. 519,962
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its soft shell pink blooms and vigorous growth habit, easy to propagate from cuttings, with flowers borne both singly and in sprays of 3 to 5 or more.

5,471
ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 30, 1983, Ser. No. 556,265
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by currant red flowers which are very long lasting on the plant and after cutting, are initially cupped and then become flat upon opening and bloom one to a stem and in small sprays and retain their color upon aging.

5,472
RED DELICIOUS APPLE TREE—JENRED CULTIVAR

Philip J. Jenkins, deceased, late of Yakima, Wash. (by Zona G. Jenkins, legal representative), assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed May 13, 1983, Ser. No. 494,553
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of spur-type Red Delicious apple tree substantially as illustrated and described, characterized by the ability to form attractive conic shaped fruit having conspicuous dark red stripes over a bright red ground color and a general similarity to its parent described in U.S. Plant Pat. No. 2,816, but being distinct therefrom by the ability of its fruit (a) to color approximately 15 days earlier, and (b) to color more completely each year in spite of environmental conditions which do not favor the fruit coloring of Red Delicious apples.

5,473
NECTARINE TREE, SUNECTTWELVE

John H. Weinberger, Fresno, Calif., assignor to Superior Farming Company, Bakersfield, Calif.

Filed Nov. 25, 1983, Ser. No. 555,190
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, broadly characterized by its general resemblance to the Fantasia Nectarine Tree (unpatented), of which it is a seedling, but from which it is distinguished as to novelty by its fruit having a substantially greater amount of overall red blush on a brighter yellow ground color, fewer cleft sutures, and a rounder shape of fruit, particularly the apex thereof.

5,474
PEACH TREE (JUNE MAID)

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 13, 1982, Ser. No. 445,445
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree as illustrated and described, which is large size, upright growth and a regular and productive bearer of firm yellow flesh, clingstone fruit with good eating and shipping quality; the fruit is further characterized by having a high degree of attractive red skin color and ripening with Gemfree Peach (U.S. Plant Pat. No. 1,409), but having more consistant production and fewer split pits.

5,475
CHRYSANTHEMUM PLANT NAMED SILVERADO

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 24, 1983, Ser. No. 526,085
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., named Silverado, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 50 to 65 mm. at maturity; uniform ten week flowering response; tall plant height when grown single stem; 10 to 15 cm. peduncles on open, normally terminal sprays, and slow development of male sterile green discs.

PATENTS

GRANTED MAY 21, 1985

ERRATA

For CLASS	See PATENT NO.
057–243	4,517,793
057–304	4,517,794
062–323	4,517,799
123–003	4,517,926
030–166	4,518,022
156–054	4,518,034
285–047	4,518,175
412–037	4,518,296
430–527	4,518,354
525–079	4,518,515
514–012	4,518,586
514–019	4,518,587
514–058	4,518,588
514–027	4,518,589
514–029	4,518,590
514–155	4,518,594
514–178	4,518,595
514–232	4,518,596
514–228	4,518,597
514–212	4,518,598
514–255	4,518,599
514–340	4,518,601
514–332	4,518,602
514–352	4,518,603
514–340	4,518,604
514–383	4,518,605
514–197	4,518,606
514–399	4,518,607
514–420	4,518,608
514–448	4,518,609
514–516	4,518,610
514–470	4,518,611
514–457	4,518,612
514–513	4,518,613
514–002	4,518,614
428–067	4,518,761

PATENTS

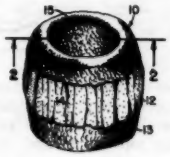
GRANTED MAY 21, 1985

GENERAL AND MECHANICAL

4,517,685
RETRO-REFLECTIVE ATTACHMENT FOR WEARING APPAREL

Gary M. Lesley, Mankato, Minn., assignor to Head Lites Corporation, Mankato, Minn.

Continuation-in-part of Ser. No. 399,826, Jul. 19, 1982, abandoned. This application Apr. 8, 1983, Ser. No. 483,192
Int. Cl.³ A41D *1/00*; A42B *1/24*
U.S. Cl. 2—170 **3 Claims**



1. A band-like safety item for wear about a portion of the body, comprising:

an elastic band of absorbent material expandable between relaxed and stretched conditions, said band being of predetermined width and having inside and outside surfaces;

a flexible but substantially inelastic strip of retro-reflective material of predetermined length circumferentially secured about at least a portion of the outside surface of said band; and

said retro-reflective strip being of substantially narrower width than said band and being secured along opposite edges thereof to said band while substantially fully stretched so that said strip is ruffled when said band is not fully stretched to enhance reflectivity and thus visibility of the wearer under conditions of poor visibility.

4,517,686
POLYPEPTIDE

Erkki I. Ruoslahti, Olivenhain, and Michael D. Pierschbacher, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Filed Aug. 4, 1982, Ser. No. 405,239
Int. Cl.³ A61F *1/00*; A61K *37/00*; C07C *103/52*; C07G *7/00*
U.S. Cl. 3—1 **7 Claims**

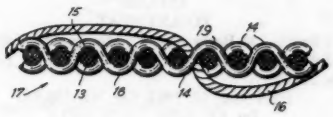
1. A composition consisting essentially of a polypeptide exhibiting a cell-attachment activity having the formula: H-Ile-Gly-Gln-Gln-Ser-Thr-Val-Ser-Asp-Val-Pro-Arg-Asp-Leu-Glu-Val-Val-Ala-Ala-Thr-Pro-Thr-Ser-Leu-Leu-Ile-Ser-Trp-Asp-Ala-Pro-Ala-Val-Thr-Val-Arg-Tyr-Tyr-Arg-Ile-Thr-Tyr-Gly-Glu-Thr-Gly-Gly-Asn-Ser-Pro-Val-Gln-Glu-Phe-Thr-Val-Pro-Gly-Ser-Lys-Ser-Thr-Ala-Thr-Ile-Ser-Gly-Leu-Lys-Pro-Gly-Val-Asp-Tyr-Thr-Ile-Thr-Val-Tyr-Ala-Val-Thr-Gly-Arg-Gly-Asp-Ser-Pro-Ala-Ser-Ser-Lys-Pro-Ile-Ser-Ile-Asn-Tyr-Arg-Thr-Glu-Ile-Asp-Lys-Pro-Ser-Gln-Met-OH, in substantially pure form.

2. A prosthetic device designed to have a surface in contact with endothetial, fibroblastic cells or the like where the likelihood of immune system rejection could be lessened by enhanced attachment of the cells to the prosthetic device having a surface to which there is linked a polypeptide having the formulas: H-Ile-Gly-Gln-Gln-Ser-Thr-Val-Ser-Asp-Val-Pro-Arg-Asp-Leu-Glu-Val-Val-Ala-Ala-Thr-Pro-Thr-Ser-Leu-Leu-Ile-Ser-Trp-Asp-Ala-Pro-Ala-Val-Thr-Val-Arg-Tyr-Tyr-Arg-Ile-Thr-Tyr-Gly-Glu-Thr-Gly-Gly-Asn-Ser-Pro-Val-Gln-Glu-Phe-Thr-Val-Pro-Gly-Ser-Lys-Ser-Thr-Ala-Thr-Ile-Ser-Gly-Leu-Lys-Pro-Gly-Val-Asp-Tyr-Thr-Ile-Thr-Val-Tyr-Ala-Val-Thr-Gly-Arg-Gly-Asp-Ser-Pro-Ala-Ser-Ser-Lys-Pro-Ile-Ser-Ile-Asn-Tyr-Arg-Thr-Glu-Ile-Asp-Lys-Pro-Ser-Gln-Met-OH.

4,517,687
SYNTHETIC WOVEN DOUBLE-VELOUR GRAFT

William J. Liebig, Hohokus, N.J., and Dennis Cummings, County Claire, Ireland, assignors to Meadox Medicals, Inc., Oakland, N.J.

Filed Sep. 15, 1982, Ser. No. 418,149
Int. Cl.³ A61F *1/00, 1/24*
U.S. Cl. 3—1.4 **13 Claims**



1. A tightly-woven, low-porosity prosthesis, to which tissue can adhere, comprising:

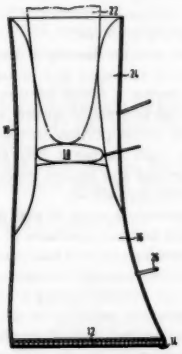
a woven double-velour fabric material formed from a warp yarn and a fill yarn and having loops formed from loop yarns about the fill yarns, the yarns being of a yarn material to which growing tissue can adhere;

the warp yarn being one of untexturized, unshrunk yarn and texturized, shrunk yarn, said fabric having loops of said texturized yarn on both surfaces thereof for facilitating adherence of tissue to said prosthesis.

4,517,688
ARTIFICIAL LEG FOR OCCASIONAL USE

Denis R. W. May, Esher, and James N. Hiddleston, London, both of England, assignors to J. D. Hanger & Company Limited, London, England

Filed Aug. 2, 1983, Ser. No. 519,782
Claims priority, application United Kingdom, Aug. 2, 1982, 8222242
Int. Cl.³ A61F *1/68*
U.S. Cl. 3—2 **1 Claim**



1. An inflatable lower limb for use by amputees comprising: an outer cover of relatively inextensible material defining the shape of the leg and having a pad of rigid material at its lower end defining the shape of the foot; and an inner member within and separate from said relatively inextensible outer cover and comprisng a plurality of independently inflatable compart-

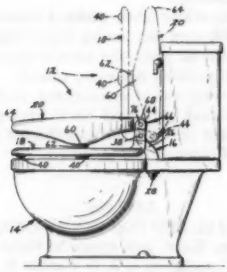
ments welded together, said inner member including an inflatable shin compartment contacting the rigid pad and being of upwardly convergent profile, a separately inflatable inner spacer compartment between the upper end of said shin compartment and the patient's stump, and a further separately inflatable annular socket compartment that surrounds the patient's stump and said shin compartment and extends downwardly in overlapping relation around the upper end of said shin compartment to resist bending of the limb at the false joint at the patient's stump.

4,517,689

TOILET SEAT

John T. Smith, 230 Barry Ave. S., Minneapolis, Minn. 55391, and John R. Smith, 5401 Cambridge Ave., St. Louis Park, Minn. 55426

Filed Mar. 10, 1982, Ser. No. 356,832
Int. Cl.³ A47K *13/26, 13/12*
U.S. Cl. 4—235 **6 Claims**



1. A toilet seat for attachment to a toilet bowl comprising:

(A) a base member having a bottom, a pair of generally parallel side portions extending upwardly from said bottom and a top face between said side portions, said base member including means for attachment to the toilet bowl, and a generally horizontally disposed aperture in each of said side portions;

(B) a first seat member having a major portion generally shaped so as to rest upon and be supported by the toilet bowl, and having a minor portion extending generally upwardly from said major portion at the peripheral edge thereof, said minor portion including a pair of spaced apart risers, each having a first generally horizontally disposed aperture and second generally horizontally disposed aperture thereabove;

(C) means disposed in each of said first apertures of said minor portion and said apertures of said side portions for pivotally fastening said first seat to said base member with said side portions located between said risers;

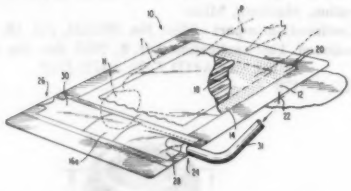
(D) a second seat member having a top and bottom surface and being pivotally mounted on said risers at said second apertures, said second seat member being capable of pivoting from a generally upright position to a generally horizontal position wherein at least a portion of said bottom surface rests atop said first seat member, and wherein the maximum dimension from said top to bottom surfaces of said second seat member is greater than the thickness of said first seat member, so that when said second seat member is in the horizontal position the effective height of the toilet seat is increased.

4,517,690

AIR PALLET HAVING MULTIPLE ENTRY INTEGRATED AIR INLET VALVES

Jack Wegener, Rte. #2, Box #195, Preston, Md. 21655

Filed May 21, 1984, Ser. No. 612,117
Int. Cl.³ B65G *7/06;* A61G *7/08*
U.S. Cl. 5—81 R **6 Claims**



1. An air pallet for the frictionless movement of a load supported by a generally rigid planar backing member over an underlying generally planar fixed support surface, said air pallet comprising top and bottom walls defining a plenum chamber, at least said bottom wall being formed of a thin flexible sheet material, said bottom wall including a portion defined by the footprint of the load having a plurality of closely spaced small diameter pin hole type perforations opening directly into the plenum chamber, air dispersion means for insuring air flow throughout the plenum chamber when the air pallet is under load at the time of air pressurization of the plenum chamber, means for controlling pillowing of the flexible sheet material to permit jacking of the backing member and the load sufficient to allow the air pallet to accommodate surface irregularities of the load support surface and the backing member while preventing ballooning of the thin flexible sheet material, air inlet means opening to the plenum chamber for permiting low pressure air flow pressurization of the plenum chamber for jacking the load and for subsequent discharge through the perforations to create an air film between the bottom wall and the fixed support surface, the improvement wherein:

said air inlet means comprises a pair of thin flexible material strips extending internally of said top and bottom walls, being of a given length, each strip having one outer lateral edge sealed to a respective one of said top and bottom walls along said edge, and being free of said other wall at said edge at least along a portion thereof to form, at the non-sealed edge portion, an air inlet opening to the interior of said air pallet along a given periphery, and wherein the length of said strips are such that their inner ends, remote from the air inlet openings, intersectingly overlap each other, such that insertion of a wand bearing air under pressure into one of said inlet openings causes automatically, as a result of the air entry blast, the overlapped portion of one of said strips to press against a given one of said upper or lower walls to effectively and immediately close off the air inlet opening not receiving said wand, thus sealing off said non-used inlet opening prior to movement of the air into said plenum chamber, thereby facilitating air dispersion throughout the plenum chamber, jacking of the load and the creation of the thin film air bearing beneath the bottom wall sheet and the underlying generally rigid support surface.

4,517,691

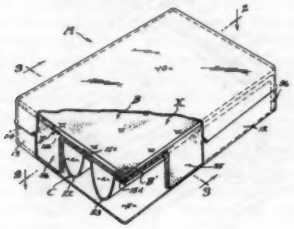
MOTION DAMPING SYSTEM FOR WATER BED MATTRESSES

Raymond M. Phillips, 2566 Tuna Canyon Rd., Malibu, Calif. 90290

Filed May 1, 1981, Ser. No. 259,461
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—450 **20 Claims**

1. In combination, a flotation mattress comprised of an enve-

lope of supple sheet material with a top body supporting panel and a bottom panel joined thereto by vertical side walls when filled with liquid, and a free floating wave motion damping unit detached from and adapted to seek a proper operating position interiorly of the mattress envelope; said floating wave motion damping unit including, a flexible frame of low density material for substantial bouyancy and having side members closely conforming to a plan configuration defined by the side walls of the mattress envelope, a pad of flexible batting carried by the frame and engageable with the top body supporting panel at



the interior of said envelope, flexible batting hanging freely from the side members of said flexible frame and juxstaposed to the side walls of the mattress envelope to reduce reflected wave motion, and curtain means of supple sheet material having a weight per volume greater than water and hanging freely from the frame in tube form with opposite ends opening closely to the side walls of the mattress for flow restriction and the entrapment of liquid therein so as to retard wave motion over the bottom of the mattress when depressed by downward displacement of the supporting panel to engage the bottom of the mattress.

4,517,692

ANTI-DECUBITUS WATERFLOATATION SYSTEM

Peter Vogel, Lausanne, Switzerland, assignor to Ardo International Marketing, Switzerland

Filed Mar. 3, 1983, Ser. No. 471,587

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—451 **3 Claims**

1. A one piece, integral waterproof frame and basin apparatus for anti-decubitus waterfloatation comprising longitudinal side frame members fabricated of a highly compressible plastic foam material which is heat sealed into plastic side compartments each said compartment having at least one air escape opening to permit the compression of the foam frame members for storage and shipping, thereby reducing the total volume of the frame to a fraction of its uncompressed volume, and having a plastic bottom and end members forming, together with said frame members, said watertight frame and basin apparatus.

4,517,693

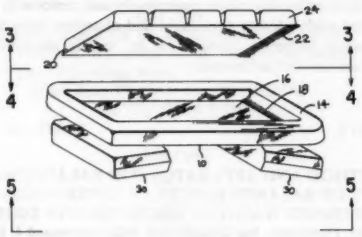
BODY SUPPORT APPARATUS

Eric A. Viesturs, Southbury, Conn., assignor to Connecticut Artcraft Corporation, Naugatuck, Conn.

Filed Feb. 21, 1984, Ser. No. 581,918

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—451 **3 Claims**



1. Body support apparatus comprising:

a flat rectangularly shaped member adapted to be on top of a rectangular mattress in a hospital bed;

a body supporting structure on the upper surface of said member, said structure including at least one hollow element rising above said upper surface and filled with a fluid selected from the class of fluids which consists of air and water; and

a separate flexible pocket disposed below the lower surface of said member adjacent one selected end thereof for removably receiving and enclosing an end of the mattress adjacent said selected end, said pocket being secured to said lower surface by a line of seal which is narrow to permit the pocket to be flexible and easy to fit, said line being elongated in the transverse direction of said member and extending over almost the entire width, each end of said line terminating in a short leg which extends longitudinally along said member away from said selected end, said line being disposed intermediate the transverse center line of said member and said selected end, said pocket extending in width along the entire width of said member and extending in length from the free ends of said legs to the selected end of said member whereby said pocket holds the member in position and prevents said member from sliding downward toward the other end of the mattress when the adjacent mattress end is raised.

4,517,694

POLLEN GATHERING DEVICE

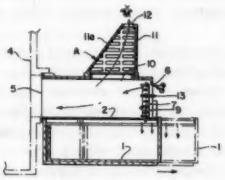
Soon Y. Hong, 23-528-Ho, 147 Hoe Hyun-Dong 1-Ga, Chung-Ku, Seoul, Rep. of Korea

Filed Nov. 1, 1983, Ser. No. 547,499

Claims priority, application Rep. of Korea, Nov. 1, 1982, 82-8615

Int. Cl.³ A01K *47/06*

U.S. Cl. 6—4 R **3 Claims**



1. A pollen gathering device adapted to be connected with a

beehive comprising, as three individual main components thereof which can be readily assembled together,

a chamber containing a top aperture and a side aperture, said side aperture containing a pollen gathering panel, and defining an inlet means to the chamber,

an outlet means comprising side wall portions and a top portion, said outlet means being operatively and removably associated with said top aperture, and

a pollen collecting means operatively and removably associated with a lower portion of said chamber, whereby said pollen gathering device can be readily assembled and disassembled as desired.

4,517,695

METHOD AND APPARATUS FOR BALANCING OF OUT-OF-BALANCE FORCES IN CENTRIFUGES OR COMBINED WASHING MACHINES-SPIN DRIERS

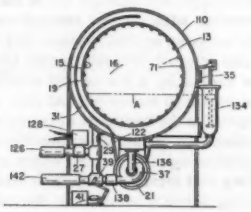
Ernst H. Hoffmann, Im Defdahl 311, 4600 Dortmund 1; Hans F. Arendt, Industriestrasse 32, 7126 Sersheim, both of Fed. Rep. of Germany; Leonhard Spiewok, Zielackerstrasse 19, CH-8304 Wallisellen, and Jakob Rettich, Kilchbergstrasse 129, CH-8038 Zürich, both of Switzerland

Filed Oct. 18, 1982, Ser. No. 435,033

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141901

Int. Cl.³ D06F *23/02, 33/02*

U.S. Cl. 8—158 **13 Claims**



1. A method for balancing of out-of balance forces in a centrifuge drier or a combined washing machine-spin drier with a drum having a substantially horizontal rotation axis comprising:

accelerating the drum of the drier to a first rotation speed at which the objects to be dried cling substantially to the drum against the force of gravity;

measuring the value of the out-of-balance force at said first rotation speed;

calculating the resulting out-of-balance force at a final rotation speed of the drum from the measured value of the out-of-balance force at the first rotation speed;

presetting a maximum out-of-balance force at the final rotation speed;

accelerating the drum to said final rotation speed if the calculated resulting out-of-balance force does not exceed a preset maximum out-of-balance force at the final rotation speed;

accelerating the drum to a second rotation speed being lower than the final rotation speed if the calculated resulting out-of-balance force exceeds the preset maximum out-of-balance force, and substantially maintaining the rotation speed in the region of said second rotation speed for a certain dwell time, which time is sufficient for a decrease of the out-of-balance force to such a degree that, at the final rotation speed, the maximum out-of-balance force is not exceeded, and after said time, accelerating the drum to the final rotation speed.

4,517,696

SYSTEM AND METHOD FOR FORMING CUSTOM-MADE SHOE INSERTS

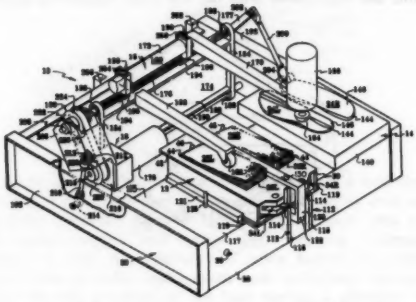
Vern R. Schartz, Boulder Creek, Calif., assignor to AMFIT, Inc., Sunnyvale, Calif.

Division of Ser. No. 286,245, Jul. 23, 1981, Pat. No. 4,449,264.

This application May 17, 1984, Ser. No. 611,109

Int. Cl.³ A43D *9/00;* **A61F** *3/00*

U.S. Cl. 12—1 R **6 Claims**



1. Apparatus for forming an impression of the contour of the undersurface of a person's foot, said apparatus comprising:

an array of pin elements movable between retracted and extended positions;

said pin elements being arranged in columns with adjoining pin elements in each column being provided with asymmetric contacting surfaces;

a plurality of separator members each disposed between adjacent columns of the pin elements; and

means for yieldingly urging the pin elements against the undersurface of the person's foot.

4,517,697

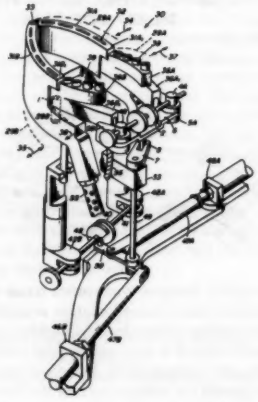
ADHESIVE APPLICATOR

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Oct. 14, 1983, Ser. No. 541,850

Int. Cl.³ B05C *5/04, 5/02*

U.S. Cl. 12—10.5 **12 Claims**



1. In a footwear forming machine wherein a footwear upper assembly comprising a footwear upper draped about a last and

an inner sole at the bottom of the last is presented to the machine for applying adhesive and wiping of the lasting margin,

an inner sole support to receive the footwear upper assembly;

means for stretching and forming the upper about the last;

means for wiping the upper margin against the inner sole; and

an adhesive applicator mechanism that comprises two extruder sections having respective toe ends and free ends operable to apply adhesive to the bottom of the inner sole respectively near each edge of the toe portion of the footwear upper assembly, the two extruder sections being pivotally adjustable at their toe ends about a single member pivot between positions wherein the free ends thereof are positioned closer to one another to accommodate small footwear sizes and wider apart to accommodate larger footwear sizes to permit application of the adhesive close to the edge of said inner sole, the upper margin being thereafter wiped against the inner sole;

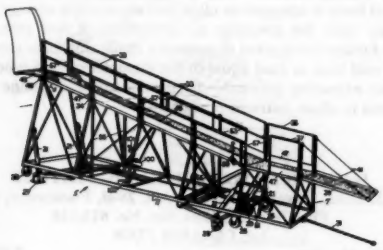
said extruder sections having adhesive opening means extending from respective toe ends and said machine having said pivot member rotatively and directly connecting said toe ends to each other and to said machine for adjustable convergence or divergence of said extruder sections to accommodate pointed shoe widths.

4,517,698

CARGO HANDLING RAMP

Thomas A. Lamp'l, and Randall W. Eby, both of 8140 SW. 58 Ave., Miami, Fla. 33143

Filed Jan. 5, 1983, Ser. No. 438,392
Int. Cl.³ E01D *15/10, 19/10*
U.S. Cl. 14—72.5 **11 Claims**



1. A cargo handling ramp comprising:

(a) a frame including an elongated walkway disposed along an upper portion thereof and said walkway including a higher end and a lower end,

(b) a plurality of legs extending substantially from said walkway downwardly and terminating at a lower frame portion,

(c) roller means secured in movably supporting relation to said frame and beneath said lower frame portion and disposed and structured to accommodate movement of said ramp,

(d) a position locking means connected to said frame and structured to secure said ramp against lateral movement over a surface on which it is mounted,

(e) incline adjusting means connected to said frame substantially adjacent said lower end of said walkway an including means for positioning said incline adjusting means into frame supporting relation relative to the surface on which said ramp is mounted, said incline adjusting means disposed and structured for selective raising and lowering of the lower end relative to the surface, whereby an inclined, angular orientation between said higher end and lower end may be varied,

(f) braking means comprising two rub rails each having an elongated configuration and disposed in substantially parallel, spaced apart relation and extending along the length of said walkway on opposite sides thereof, said rub rails movably connected to said frame and positionable relative to one another into and out of engaging relation to carriers traveling along said walkway, and

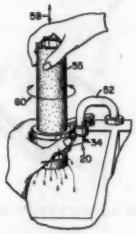
(g) said braking means further compirising means to normally position said rub rails into the constricting relation to carriers traveling along the length of the walkway between said rub rails.

4,517,699

PAINT ROLLER CLEANING APPARATUS

Ronald E. Petricka, Wyoming, Minn., assignor to Deluxe Innovations, Inc., Wyoming, Minn.

Filed Apr. 19, 1984, Ser. No. 602,143
Int. Cl.³ B08B *3/00*
U.S. Cl. 15—104.04 **8 Claims**



1. A roller cleaning apparatus for cleaning a roller pad of a roller, comprising:

(a) an annular sleeve having an outer surface and an inner surface adapted to have an interference fit with the roller pad;

(b) liquid passage means within said sleeve intermediate of said inner and outer surfaces;

(c) liquid entry means interconnected to said liquid passage means, said liquid entry means including a threaded cylindrical portion adapted for threaded attachment of the cleaning apparatus to a source of water or other liquid, said threaded cylindrical portion having a substantially parallel orientation with respect to said annular sleeve;

(d) liquid outlet means on the inner surface of said annular sleeve communicating with said liquid passage means; and

(e) a plurality of spaced, axially directed scrubber elements positioned circumferentially about the inner surface of said annular sleeve along at least a portion of the longitudinal extent of the inner surface.

4,517,700

ADJUSTABLE SCRAPER TOOL

Joseph G. Pinto, Salisbury, Md., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 438,138, Nov. 1, 1982,. This application Aug. 15, 1984, Ser. No. 640,912
Int. Cl.³ B05C *17/00*
U.S. Cl. 15—105 **5 Claims**

1. An adjustable scraping and sanding tool including a housing, an adjustable handle operatively connected thereto and a pad releasably attached to the housing,

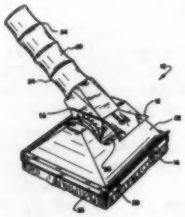
the housing having a bottom wall about the periphery of the housing, the wall sized for releasably receiving a painting or a sanding pad,

the housing having a generally prismatoidal configuration and a substantially centrally positioned undercut, the housing including a handle shaft substantially within the centrally positioned undercut but being exposed for reception of the handle,

the handle shaft including a retaining pad having a diameter greater than the diameter of the shaft, the handle shaft

further including a thumbwheel with an internally threaded opening, the handle shaft having a threaded portion along its length, spaced from the retaining pad to threadedly engage the thumbwheel, whereby the thumbwheel is rotatable on the shaft toward and away from the retaining pad in order to compressively retain the handle, the thumbwheel being substantially within the undercut but exposed therefrom,

the handle including a shaft through-hole for rotatable reception of the shaft between the retaining pad and the thumbwheel, at least one locking protrusion on one of the retaining pad and the handle and a plurality of grooves in the other for mating reception of the retaining pad and the handle,



the handle further having a receiving slot for close reception of a scraper,

a scraper closely received in the receiving slot,

the pad including a clip-on support member so that the pad may be releasably attached to the bottom walls of the housing whereby

the angle of the handle of the tool may be manually adjusted relative to the housing with one hand by rotating the thumbwheel away from the retaining pad until the protrusion no longer engages a groove, angularly moving the handle relative to the housing and then rotating the thumbwheel so that it moves toward the retaining pad thus causing the protrusion to move into one of the grooves.

4,517,701

TOOTHBRUSHES FOR CLEANING SULCULAR AREAS OF THE TEETH

Roy E. Stanford, Jr., 6829 Tennyson Dr., McLean, Va. 22101

Continuation of Ser. No. 488,627, Apr. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 283,031, Jul. 13, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,570

Int. Cl.³ A46B 9/04

U.S. Cl. 15—106 **16 Claims**

13. A toothbrush comprising:

a stem defining a handle portion and a bristle-supporting portion, said bristle-supporting portion extending generally in a plane;

said bristle-supporting portion curving along its length in said plane to conform to a curved dental profile and comprising generally oppositely disposed bristle-supporting surfaces;

said toothbrush further comprising bristles extending from each of said oppositely disposed surfaces, at least some of the bristles extending from each of said surfaces being canted inwardly toward the inside of said curve.

4,517,702

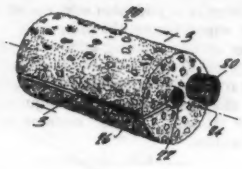
ENDOSCOPIC SCRUB DEVICE

Frank W. Jackson, Twillingate, R.D. 3, Mechanicsburg, Pa. 17055

Filed Jun. 29, 1983, Ser. No. 508,792

Int. Cl.³ B08B 9/02

U.S. Cl. 15—114 **3 Claims**



1. A self-contained cleaning device for use in combination with endoscopic instruments having a tube portion for insertion into a body orifice, comprising: a generally cylindrical shaped sponge body having an axially aligned central bore sized to fit the tube portion of said instrument, said sponge body having a slit extending parallel to and in communication with said bore to permit said body to be fitted over said tube, said slit being narrow enough so that slight gripping pressure on said body is adequate to close said slit to cause sponge body contact with the complete circumference of said tube, said body further being sized to present a radial thickness outward from said bore at least equal to the diameter of said tube, and a brush extending outwardly from an end of said sponge body adapted to clean instrument portions.

4,517,703

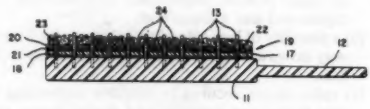
HAIR BRUSH WITH CLEANING FEATURE

Eric J. Koke, Pleasant View Dr., Apt. 28-B, Piscataway, N.J.

Filed May 24, 1984, Ser. No. 613,433

Int. Cl.³ A46B 17/06

U.S. Cl. 15—246 **2 Claims**



2. A hair brush having a cleaning feature, comprising:

a base having a multiplicity of parallel bristles extending from a bristle-holding surface thereof, each bristle having a generally cylindrical stem and an enlarged free end;

a foraminous guide plate disposed adjacent said bristle-holding surface of said base and having holes through which corresponding ones of said bristles extend, each hole in the guide plate being larger in diameter than the stem of the corresponding bristle and smaller in diameter than the enlarged end of said corresponding bristle, so that the guide plate can slide along the bristles but cannot be removed therefrom; and

a cleaning plate having a layer comprising resilient material with bristle-receiving holes aligned in a pattern conforming to the pattern of said bristles,

each hole in said resilient layer being adapted to tightly engage the corresponding bristle,

said cleaning plate also having a relatively rigid support sheet with bristle-receiving holes coaxial with the holes in said resilient layer,

said bristle-receiving holes being larger in diameter than the enlarged ends of the bristles,

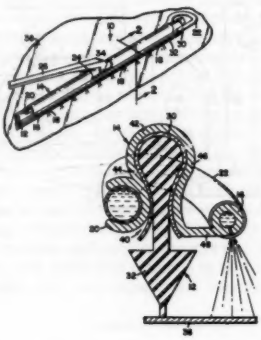
said resilient layer being secured to the support sheet,

whereby the cleaning plate can be entirely removed from the bristles for cleaning purposes, while the guide plate can be brought adjacent the free ends of the bristles to facilitate re-installation of the cleaning plate thereon.

4,517,704
WINDSHIELD WASHER APPARATUS

Robert D. Benson, 2521 Cedar Ave., White Bear Lake, Minn. 55110

Filed Jun. 17, 1983, Ser. No. 505,193
Int. Cl.³ B60S 1/48
U.S. Cl. 15—250.04 **13 Claims**



11. A removable windshield washer attachment apparatus for a rigid wiper blade, the wiper blade having a relatively straight rigid spline portion and a flexible wiper blade portion attached thereto for making contact with the surface of the windshield, the washer attachment comprising:

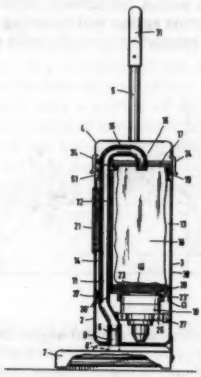
(a) an elongated elastic snap-on element having a generally U-shaped cross section, said snap-on element being resiliently deformable between a deformed state and a normal state, said snap-on element being in said deformed state when attached to the spline of the wiper blade, said snap-on element tending to return to said normal state from said deformed state, said snap-on element engaging the spline of the wiper blade to remain removably attached thereto and oscillate therewith, said elongated snap-on element being in a substantially parallel contiguous relationship to the wiper blade when releasably attached thereto; and

(b) a hollow tubular element of one piece with said elongated snap-on element extending longitudinally along one side of said elongated snap-on element, said hollow tubular element defining a plurality of apertures therein, said tubular element including a fluid access port enabling fluid communication therewith by a source of cleaning solution.

4,517,705
SUCTION DEVICE FOR CLEANING TEXTILE FLOOR COVERINGS

Nikolaus Hug, Romanshorn, Switzerland, assignor to Düpro AG, Romanshorn, Switzerland

Filed Jun. 2, 1983, Ser. No. 500,568
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220644
Int. Cl.³ A47L 5/30
U.S. Cl. 15—351 **35 Claims**



1. In a suction device for cleaning textile floor coverings comprising a housing enclosing a dust chamber for receiving a dust filter bag, a cover detachably mounted on said housing in a sealed air-tight manner, a cleaning device for floor coverings having a flexibly supported suction air connector sleeve, said housing surrounding a tubular stub for receiving said suction air connector sleeve, electrical components disposed in said housing, a dust air canal connecting said tubular stub and said dust chamber, the improvement comprising:

a base member forming part of said housing wherein said base member is in fluid communication with said dust chamber and houses at least a portion of said electrical components and at least a portion of said dust air canal;

support member means for detachably and supportably connecting said base member to said cleaning device; and

said base member includes said tubular stub detachably receiving said suction air connector sleeve of said cleaning device;

whereby said cleaning device is easily removable from said base member.

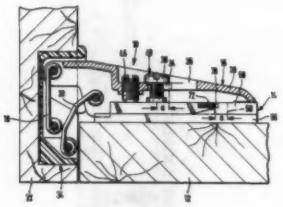
4,517,706
ADJUSTABLE CABINET HINGE HAVING A BIASED CATCH

Karl Lautenschläger; Horst Lautenschläger, both of Reinheim, and Gerhard Lautenschläger, Brensbach, all of Fed. Rep. of Germany, assignors to Karl Lautenschlager KG, Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,577
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223937; Jan. 17, 1983, 3301279
Int. Cl.³ E05D 7/04
U.S. Cl. 16—238 **17 Claims**

1. A cabinet hinge having a supporting-wall-related part in the form of an elongated supporting arm of substantially channel-shaped cross section; a door-related part; hinge link means pivotally coupling said two parts so as to be pivotable about a pivot axis; a mounting plate adapted to be fastened to a supporting wall surface of a cabinet and having a bottom surface for placement on said supporting wall, a top surface essentially parallel to the supporting wall when mounted thereto, and also

having at least one side surface essentially perpendicular to said top surface; said supporting arm being held releasably and adjustably in at least two coordinate directions on said mounting plate, said supporting arm having supporting-arm side walls at least partially straddling said mounting plate and also having a web joining said supporting-arm side walls, said web having a slot which is provided at a transition area remote from said hinge link with an access opening; a mounting screw having a head, and a shank which is driven into said mounting plate and is adapted to pass from said access opening into said slot; said supporting arm also being provided at a distance from said slot in said web with a tap through which may pass a headless screw for bearing against said mounting plate; a recess in at least one of said supporting-arm side walls and having an



abutment running substantially at right angles to said top surface of said mounting plate and facing toward the hinge link end of said supporting arm; a resilient catch element disposed in the area of said mounting plate opposite said recess, said catch element being biased to a position in which it protrudes beyond said at least one side surface of said mounting plate, said catch element having a movable tip pointing in a direction away from said hinge link, said abutment and said tip being in such a position that upon a longitudinal displacement of said supporting arm on said mounting plate parallel to said top surface, said abutment and tip will snap into engagement with one another when said shank of said mounting screw driven into said mounting plate arrives in said transition area from said slot to said access opening.

4,517,707

APPARATUS FOR RECOVERING MEAT OF SMALL CRUSTACEANS

Yakov I. Braginsky; Igor V. Gultsev; Viktor A. Mitrofanov; Nikolai A. Nikitushkin, and Yury F. Yaroshenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Exerimentalno-Konstruktorsky Institut Prodovol-Stvennogo Mashinostroenia, Moscow, U.S.S.R.

PCT No. PCT/SU82/00023, § 371 Date Mar. 1, 1983, § 102(e) Date Mar. 1, 1983, PCT Pub. No. WO83/00080, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 1, 1982, Ser. No. 474,662

Claims priority, application U.S.S.R., Jul. 8, 1981, 3312681; Jun. 18, 1982, 3448077

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—71 **7 Claims**

1. Apparatus for recovering meat of small crustaceans, comprising:

a shell breaking-up mechanism for breaking up the shells of the crustaceans, said shell breaking-up mechanism comprising:

a loading device for receiving the crustaceans,

breaking-up means downstream of said loading device for breaking up the shells of the crustaceans,

a first chamber downstream of said breaking-up means for receiving from said breaking-up means the crustaceans having broken-up shells, said first chamber having a bottom and an outlet adjacent said bottom, and

means for providing a working liquid to said first chamber;

an intermediate mechanism for separating easily rising components of said crustaceans having broken-up shells, said intermediate mechanism comprising:

an intermediate chamber downstream of said first chamber for receiving from said outlet of said first chamber said crustaceans having broken-up shells, via a conduit extending between said outlet of said first chamber and an inlet of said intermediate chamber,

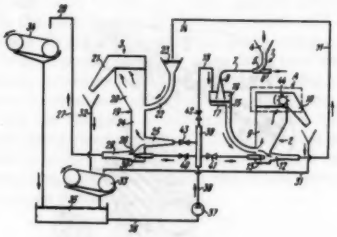
said inlet being disposed adjacent a bottom of said intermediate chamber and below said outlet of said first chamber,

a working liquid substantially filling said intermediate chamber,

said intermediate chamber having a lower outlet disposed in generally opposed relationship to said inlet,

jet means for providing a stream of a working liquid directed from a region adjacent said inlet toward said lower outlet, for transporting to said lower outlet those portions of said crustaceans which do not easily rise, and

surfaced component removing means disposed adjacent a top of said intermediate chamber for withdrawing from said intermediate chamber via an upper outlet thereof easily rising components of said crustaceans which rise



in the working liquid disposed within said intermediate chamber; and

a meat-separating mechanism for separating the meat from other portions of said crustaceans, said meat-separating mechanism comprising:

loading means downstream of said intermediate chamber for receiving from said lower outlet of said intermediate chamber those portions of said crustaceans which do not easily rise,

a conduit for transporting, from said lower outlet of said intermediate chamber to said loading means, those portions of said crustaceans which do not easily rise, said conduit having an outlet end adjacent said loading means and disposed above said loading means and above the level of liquid within said intermediate chamber,

a third chamber for receiving from said loading means those portions of said crustaceans which do not easily rise, and

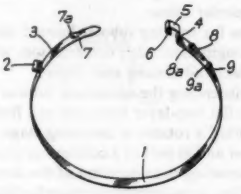
meat-separating means including a working liquid operatively associated with said third chamber for separating the meat of said crustaceans from other portions of said crustaceans disposed within said third chamber.

4,517,708

CLAMP

Lionel Calmettes, Ozoir la Ferriere, and Michel André, Romorantin Lanthenay, both of France, assignors to Etablissements Caillau, Billancourt, France

Continuation of Ser. No. 421,322, Sep. 22, 1982,. This application Feb. 1, 1984, Ser. No. 575,488
Claims priority, application France, Nov. 6, 1981, 81 20870
Int. Cl.³ B65D 63/00; F16L 47/00
U.S. Cl. 24—20 CW 3 Claims



1. Re-usable clamp, comprising a wound metal strap having two ends, said strap having two radial lugs projecting externally from the strap at respective ends thereof, the first of said lugs extending into a portion which follows the periphery of the clamp to constitute a sole-plate extending at least over the distance separating the two lugs, the second lug is formed with an extension arranged substantially parallel to the periphery of the clamp and situated at a distance therefrom nearly equal to the height of one lug, said extension of the second lug being provided with a short hooked portion having a free end constituting a clamping member for fastening over the first lug in a tightened position of the clamp, said sole-plate including an extending part extending from the first lug and having at least one asperity projecting externally from an end of said extending part to cooperate with a bearing element of a recess correspondingly formed in the strap behind the second lug, wherein the asperity in said extending part is spaced from said first lug by a length greater than the length from the extension of the second lug to the bearing element of said recess behind the second lug, whereby when said clamp is in a closed but untightened position said asperity engages said bearing element of said recess and when said clamp is in said tightened position said asperity does not engage said bearing element of said recess.

4,517,709

CLOTHES HANGER HOOK

Norbert Arentsen, O'Fallon, and Frances A. Rentchler, P.O. Box 15, Belleville, Ill. 62222, assignors to Frances Rentchler, Belleville, Ill.

Continuation of Ser. No. 428,887, Sep. 30, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 630,308
Int. Cl.³ A47J 51/095
U.S. Cl. 24—232 R 8 Claims

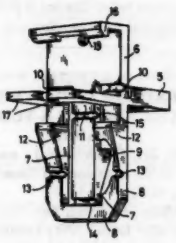
1. A clothes hanger hook comprising a fixed part having a shank with a round tang as an extension of one end thereof and adapted to extend through a hole in a hanger, and a crook with a free end and spring mounting means on said free end at the other end of said shank, and a movable keeper hinged to said crook, said movable keeper having a nose part with an outer end normally extending in a substantially continuous arc with said crook beyond said free end, wings extending from said nose part and straddling at least a part of said crook and a bottom wall bridging between and connecting said wings below an adjacent surface of said crook, a seat in said nose part, a spring with one end mounted on said seat and another end on said crook end spring mounting means, and means behind the crook end spring mounting means for hinging said movable keeper to said crook, said spring biasing the nose part of said movable keeper in a direction toward said shank but spaced therefrom and the bottom wall of said movable keeper into engagement with only a portion of an inner surface of said crook to limit the travel of said keeper nose toward said shank, the hinge axis of said hinging means being inboard of a hanger rod on which the hook rests, whereby the weight of the hanger and its load increases the bias of the keeper toward the closed position.

4,517,710

FASTENING CLIP FOR MOTOR VEHICLE TRIM

Norbert Beckmann, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,584
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142061
Int. Cl.³ A44B 17/00; F16B 13/04
U.S. Cl. 24—453 4 Claims

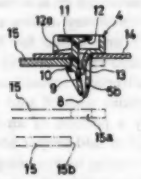


1. A fastening clip for fastening a component which has a hole through it to a surface which also has a registering hole through it, the clip comprising a rectangular body, a supporting plate and a tongue extending generally at right angles to the plate, the tongue including first and second expanding arms and first and second locking arms, the first expanding arm beng connected by an integral bending area to the second locking arm and the first locking arm being connected by an integral bending area to the second expanding arm, the first expanding arm and second locking arm being partially separated by slots from the first locking arm and the second expanding arm to permit relative movement therebetween and the end of the second locking arm remote from the supporting plate being connected by an integral bending area to the second expanding arm, the first expanding arm being extended from the rectangular body through the supporting plate and connected to the supporting plate by an integral bending area positioned between the rectangular body and the supporting plate so that the extension can be bent about the last mentioned bending area to cause the first and second locking arms and the first and second expanding arms to form between them a four-sided shape.

4,517,711
PLATE CLAMPING DEVICE

Toshie Tanaka, Tokyo, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Mar. 29, 1983, Ser. No. 469,190
Claims priority, application Japan, Mar. 4, 1982, 57-29560[U]
Int. Cl.³ A44B 17/00
U.S. Cl. 24—453 4 Claims

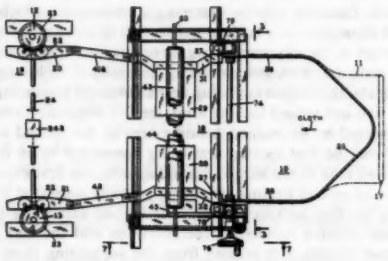


1. A device for clamping two plates closely with their surfaces placed on each other comprising: a hollow open sided head consisting of three interconnected wall portions and inner flat projections integrally connected to the lower edge of each wall portion forming a base for said head; two opposite depending side elements each provided with a one-way side catch, said elements integrally connected to each other with a cross waist; a tongue integrally connected at one end thereof to the intermediate inner flat portion of said base in the form of a cantilever and projecting slantingly in a longitudinal hollow channel defined by the opposite depending side elements; a leg extension integrally connected to said cross waist by a hinge of reduced thickness said leg provided with a front catch on its back; and a foot integrally connected to the end of the leg extension, whereby the leg is subjected to the repulsive resilient force of the tongue when the leg is folded around the hinge to fit in the longitudinal hollow channel.

4,517,712
METHOD FOR AUTOMATICALLY DETECTING AND ORIENTING THE EDGE OF A TUBULAR KNITTED FABRIC

Edmund A. Diggle, Jr., Oradell, N.J., and Andrew P. Cecere, Valley Stream, N.Y., assignors to Samcoe Holding Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,972
Int. Cl.³ D06C 5/00; D06H 3/12
U.S. Cl. 26—51.4 7 Claims



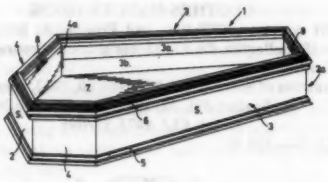
1. A process for treating stripe matched tubular knitted fabric wherein the fabric has a longitudinally sewn seam, which comprises
(a) controllably advancing said fabric,
(b) lightly distending the advancing fabric to generally flat two-layer form and to a first width during a rotational orienting stage,
(c) thereafter and as part of a continuous procedure progressively increasing the distention of the advancing fabric to a second and greater predetermined width,
(d) during said rotational orienting stage, adjusting and controlling the position of said seam in relation to the edge of said flat fabric form by externally engaging the fabric across its opposed flat layers and imparting to the advancing fabric layers angularly directional rolling components of advancing movement in a direction at a controllable angle to the longitudinal axis of said advancing fabric tube, and
(e) thereafter treating the tubular fabric and delivering treated tubular fabric.

5. A process for treating tubular knitted fabric wherein the fabric has a longitudinal edge demarcation, which comprises
(a) controllably advancing said fabric,
(b) lightly distending the advancing tubular fabric to generally wide flat two-layer form and to a first predetermined width during a rotational orienting stage,
(c) thereafter and as part of a continuous procedure progressively increasing the distention of the advancing fabric to a second and greater predetermined width,
(d) during said orienting stage, engaging substantial upper and lower flat surface areas of said fabric and imparting directional rolling components of driving movement thereto, at a controllable angle to the axis of said advancing fabric for rotationally orienting said advancing fabric tube,
(e) during said orienting stage, the form of said fabric being relatively enlarged in thickness and correspondingly narrowed in width to provide a relatively flat edge area of enlarged dimension in the thickness dimension,
(f) sensing the position of the edge demarcation in the region of said flat edge area,
(g) adjusting said controllable angle in accordance with the displacement of said edge demarcation from a predetermined position, and
(h) thereafter treating said fabric in tubular form and delivering treated tubular fabric.

4,517,713
COFFIN

Sven A. Swallert, 11, rue Michel-Chauvet, 1208 Geneva, Switzerland

Filed Apr. 17, 1984, Ser. No. 601,332
Int. Cl.³ A61G 17/00
U.S. Cl. 27—4 5 Claims

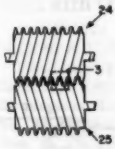


1. Coffin comprising a box having a cover, an upper frame, a lower frame, and an inside fitting, the box having hinged lateral walls permitting its folding to a storage and transportation position in which its height is a fraction of its height in service position, half of the lateral walls being formed of only one flap hinged on one of said frames whereas the other half of the lateral walls are made of two flaps hinged together along a middle line and to each of the frames respectively along directions parallel to said middle line, the walls formed by only one flap comprising locking means for the coffin in service position, the outside periphery of the coffin being covered with a supple and tight envelope covering said lateral walls.

4,517,714
NONWOVEN FABRIC BARRIER LAYER

Scott W. Sneed; Bill R. Schwam, both of Memphis, and Paul E. Gregory, Jr., Germantown, all of Tenn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 23, 1982, Ser. No. 401,169
Int. Cl.³ D04H 3/10
U.S. Cl. 28—103 8 Claims



1. A process for making a nonwoven fabric barrier layer from at least two plies of hydrophobic microfine fiber webs, the fabric barrier layer having significantly increased liquid strike through resistance without any appreciable loss of air porosity in comparison to the original plies, comprising the steps of:

(a) simultaneously passing at least two abutting plies of hydrophobic microfine fiber webs through a sufficiently constrictive nip between two interdigitating grooved rolls to effect lateral stretching of said webs and light bonding of said webs together;

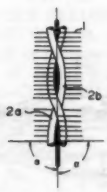
(b) passing said fabric barrier layer over a means for extending the fabric barrier layer to its fullest resultant width; and

(c) collecting the fabric barrier layer.

4,517,715
CHENILLE WOVEN OR KNITTED FABRIC AND PROCESS FOR PRODUCING THE SAME

Shusuke Yoshida; Tamotsu Nakajima, both of Otsu, and Miyoshi Okamoto, Takatsuki, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,429
Claims priority, application Japan, Apr. 13, 1982, 57-61410; Jun. 25, 1982, 57-108330; Sep. 9, 1982, 57-157112
Int. Cl.³ D03D 27/18; D02G 3/42
U.S. Cl. 28—144 9 Claims



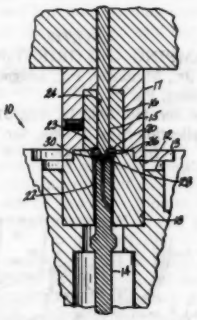
1. An improved chenille woven or knitted fabric comprising at least a chenille yarn provided with a core portion and an effect portion held by said core portion, said effect portion comprising raised fibers formed by synthetic ultra-fine fibers having a fineness smaller than 0.9 denier, a rising angle α between an axis of a raised fiber and a longitudinal axis of said chenille yarn being not larger than 50°.

8. A process for the production of an improved chenille woven or knitted fabric utilizing at least a chenille yarn composed of synthetic fibers, comprising forming said fabric from a chenille yarn having a core portion and an effect portion held by said core portion wherein said effect portion comprises raised fine fibers forming a raised fiber portion of said chenille yarn and are composed of ultrafine fibers having a fineness smaller than 0.9 denier and a rising angle α between an axis of said raised fine fibers and a longitudinal axis of said chenille yarn of not larger than 50°, dyeing the woven or knitted fabric and subjecting said woven or knitted chenille fabric to a surface pressing treatment, in the wet condition, after said dyeing.

4,517,716
PRIMER POCKETING METHOD FOR BRASS CARTRIDGE CASES

Gerald E. Eberhart, Bethalto, and Goah T. Sauls, Cottage Hills, both of Ill., assignors to Olin Corporation, Stamford, Conn.

Filed Jan. 31, 1983, Ser. No. 462,627
Int. Cl.³ B21D 51/54; B21K 21/06
U.S. Cl. 29—1.3 4 Claims



1. A method of forming a primer pocket in a metallic cupped cartridge case blank which method comprises the steps of:

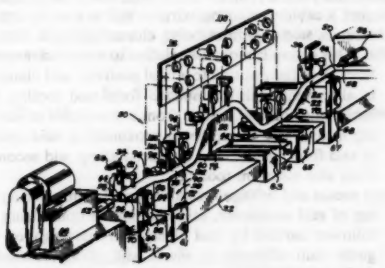
a. holding the blank with one side of the base unsupported while simultaneously

b. forcing a punch a sufficient distance partially through the base of the blank from the side opposite said one side with a pressure sufficient to cause the remaining unpunched portion of the base to separate to produce a primer pocket passing completely through said base.

4,517,717
CRANKSHAFT INSPECTION APPARATUS AND METHOD

Elvin O. Gentry, 1419 Towanda St., Bloomington, Ill. 61701

Filed Dec. 5, 1983, Ser. No. 558,422
Int. Cl.³ B21K 1/08
U.S. Cl. 29—6 14 Claims



1. Apparatus for inspecting a crankshaft including a pair of spaced journal portions for formation into journals and at least one throw for entering into a power transfer relationship with another mechanical component, said apparatus comprising:

first holding means for releasably holding one of said journal portions with respect to a first predetermined position;

second holding means for releasably holding the other of

said journal portions with respect to a second predetermined position; and

position detection means for providing indication of out-of-tolerance deviation of the position of said throw from a third predetermined position.

4,517,718

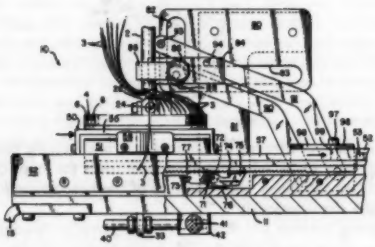
CABLE CLAMPING AND ORIENTING APPARATUS

Keith Johnson, Jr., Manheim, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 298,132, Aug. 31, 1981, abandoned. This application May 3, 1984, Ser. No. 606,541

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—33 M **9 Claims**



1. Apparatus for inserting wires into the wire-receiving portions of terminals in an electrical connector, said connector being of the type having said wire-receiving portions arranged in a row which extends from one end of the connector to the other end thereof, said machine having a stationary frame, insertion tooling in said frame which is reciprocable along a first path, a carriage in said frame which is reciprocable along a second path which extends normally of said first path, connector holding means on said carriage for holding said connector, indexing means for indexed movement of said holder on said second path through said tooling, and a cable clamp for clamping a cable containing wires which are to be connected to terminals, said apparatus being characterized in that:

said cable clamp is movable relative to said insertion tooling from an initial position to a final position, said clamp being in alignment with and spaced from said tooling in said initial position and spaced from a connector in said holding means, said clamp being proximate to said connector in said final position and displaced along said second path from said insertion tooling,

cam means and linkage for moving said clamp during indexing of said connector, said cam means comprising a cam follower carried by said clamp and interengaged with a guide cam effective to move said clamp towards said connector during insertion of the wires to the terminals between one end of said row and a midpoint thereof, and being effective to move said clamp parallel to said connector during insertion of the wires to the terminals between said midpoint and the other end of said row, said linkage comprising a first link arm between said clamp and said carriage, said link arm being pivotally connected to said clamp and pivotally connected to said carriage.

4,517,719

MAGNETIC ROLLS FOR ELECTROSTATIC RECORDING DEVICES

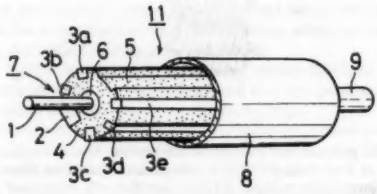
Kunio Okumura, Hachioji; Yasuo Fukuyama, Uji, and Atsuo Tanaka, Yawata, all of Japan, assignors to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Filed Apr. 16, 1982, Ser. No. 368,998

Claims priority, application Japan, Apr. 20, 1981, 56-59958; Mar. 12, 1982, 57-39916

Int. Cl.³ B21B *27/00*

U.S. Cl. 29—124 **5 Claims**



1. A magnetic roll for electrostatic recording devices comprising a plurality of magnets integrally set fast with a retaining member at stated portions of the periphery of a roll shaft, each of said magnets extending longitudinally along a line parallel to the roll shaft axis for forming a magnetic force generating part, wherein said retaining member comprises a retaining layer formed of a synthetic resin material having a hardness in the range of 40 to 95 on the Shore Hardness Scale and a strain absorbing groove extending longitudinally along a line parallel to the roll shaft axis at a portion outside said magnetic force generating part for preventing the roll from bending as a result of the difference in thermal strain between the magnetic force generating part of the roll and the non-magnetic part of the roll.

4,517,720

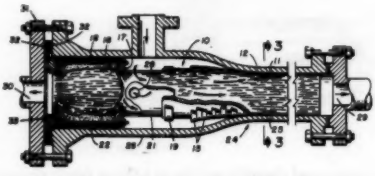
METHOD OF MOUNTING A FLUID SEPARATION MODULE IN A TUBULAR SHELL

Roger S. Otstot, and Charles J. Runkle, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 332,911, Dec. 21, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,364

Int. Cl.³ B21D *53/00*

U.S. Cl. 29—157 R **6 Claims**



1. The method of mounting a fluid separation module in a tubular shell having an enlarged end portion, comprising

(a) providing a module comprised of

(1) a bundle of hollow fiber membranes,

(2) a tube sheet positioned at one end of the bundle of hollow fibers, said fibers extending through the tube sheet,

(3) a resilient sheet having the form of a slit tube, said slit tube normally having an outer diameter greater than the inner diameter of the shell, said slit tube being secured to the tube sheet in a position surrounding the bundle of fibers, and

(4) holding means in contact with the slit tube for confin-

ing said slit tube in a cylindrical configuration having an outer diameter smaller than the inner diameter of the shell, and for holding said bundle in a compressed state,

(b) inserting the module into the shell through said enlarged end portion, and

(c) releasing the slit tube from confinement by the holding means to allow said slit tube to expand into contact with the inner surface of the shell.

4,517,721
METHOD OF MAKING A TUBE IN SHEET HEAT EXCHANGER

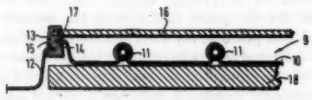
William R. Graham, Cambridge, England, assignor to TI (Group Services) Limited, Birmingham, England

Continuation of Ser. No. 396,064, Jul. 7, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,533

Claims priority, application United Kingdom, Jul. 9, 1981, 8121189

Int. Cl.³ B21D *53/08*

U.S. Cl. 29—157.3 C **6 Claims**



1. A method of forming a heat exchanger comprising the steps of forming a sheet of material into a frame and a heat absorbing panel with a tubular element partially embedded therein, deforming the sheet about the tubular element, forming the outer portions of said sheet into a first upwardly extending section, forming said outer portion of said first upwardly extending section into an outwardly extending section and forming the outer portion of said outwardly extending section into a second upwardly extending section, severing said sheet in the central portion of said outwardly extending section to define the outer periphery of said panel and the inner periphery of a frame member, securing an insulative jointing member to the outer periphery of said panel, inverting said frame mebmer and securing the portion of the inverted frame in said insulative jointing member in spaced relationship to said panel.

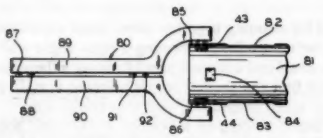
4,517,722
BAR STOCK FEEDING TOOL

Robert J. Cimarusti, 2537 Wood St., and Stanley A. Posinger, 2521 N. Thatcher, both of Rivergrove, Ill. 60171

Filed Oct. 18, 1983, Ser. No. 543,044

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—234 **9 Claims**



1. A tool apparatus for altering the geometric configuration of bar stock feeding equipment and particularly the bar stock feeding conduit member, for the purpose of removing, in a facilitated manner, one or more of a plurality of bar stock feed pads located therewithin said conduit, said tool apparatus comprising:

integrated handle means for consolidated and leveraged operation of said tool apparatus through one or both hands of a user;

said integrated handle means having a first end, and a second end opposite to said first end along the longitudinal axis of said integrated handle means;

pad release means positioned at the first end of said integrated handle means for cooperation with pad maintenance features of said bar stock feeding conduit, said pad maintenance features including alteration slots and prompting apertures possessed by said bar stock feeding equipment;

said pad release means including substantially U-shaped tool forking means for simultaneously encircling said bar stock feeding means so as to position said pad release means at diametrically opposed positions adjacent said pad maintenance features for alternative insertion thereinto towards the opening of said bar stock feeding means, the facilitated maintenance of said bar stock feeding conduit in its said open position and the closing of said bar stock feeding conduit means to its closed position;

said tool forking means emanating outwardly from said first side of said integrated handle means to as to continue in the direction of said first side, to describe an upper tine and a lower tine;

said pad release means further including one or more eccentrically shaped prompting elements positioned along one or more of said lower inner side of said first upper tine and the upper inner side of said second lower tine in substantial longitudinal axial alignment of said prompting elements,

each of said one or more prompting elements being positionable and shaped so as to be capable of insertion into the prompting apertures of said bar stock feeding conduit member so as to be capable of prompting deformation of said conduit member along its alteration slots upon the pivoting of said tool apparatus through said integrated handle means about an axis described through the substantially aligned longitudinal axis of each of the one or more prompting elements;

said simultaneous deformation serving to enlarge the end of said bar stock feeding conduit member to in turn enable the loosening of the positions of two or more bar stock feed pads positioned within the endmost portion of said bar stock feeding conduit member so as to permit the removal, replacement and relocking of such bar stock friction pads within said bar stock feeding conduit member.

4,517,723
DEVICE FOR INSERTING A RESILIENTLY DEFORMABLE ARTICLE INTO A POCKET

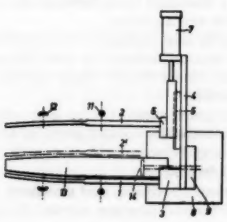
René Tschan, Reinach, Switzerland, assignor to Lonza, Ltd., Gampel, Switzerland

Continuation of Ser. No. 356,460, Mar. 9, 1982, abandoned, which is a division of Ser. No. 194,220, Oct. 6, 1980, Pat. No. 4,346,509. This application Apr. 13, 1984, Ser. No. 600,197

Claims priority, application Switzerland, Aug. 22, 1980, 6341/80

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 **43 Claims**

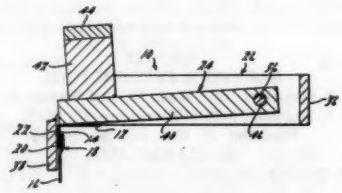


1. A device for inserting a resiliently deformable bouyant insert article into a pocket of a life jacket vest, comprising:

a column;
a holder supported by said column;
an elongated support having two opposed elongated edges, a first elongated support end and a second elongated support end, said first elongated support end being fixedly attached to said column, said second elongated support end being free;
said elongated support being adapted to bend along its length under a load;
an elongated first arm having a fixed first arm end which is fixedly attached to a fixed portion of said column, said elongated first arm extending generally in the same direction as, and at a predetermined distance from, said elongated support;
said elongated first arm having another arm end which is free;
said elongated first arm being adapted to bend along its length under a load;
a second elongated arm having a free second arm end and a fixed second arm end;
a carriage guide fixed to said holder, said carriage guide being adapted to guide motion of said second elongated arm along a generally linear path in a direction which is generally transverse to the direction of extent of said second elongated arm;
said second elongated arm being fixedly attached at said fixed arm end of said second arm to a movable part for movement therewith;
said movable part being slidably supported by said carriage guide;
a means for moving said movable part along said carriage guide;
said second elongated arm being adapted to bend along its length under a load;
said elongated second arm extending generally in the same direction as said elongated first arm;
said elongated second arm being movable with said movable part to a first position by said means for moving, said elongated second arm in said first position being spaced apart from said elongated first arm to receive in abutting contact between said elongated first and second arms the resiliently deformable article in an undeformed condition;
said elongated second arm being movable by said means for moving to a second position closer to said elongated first arm than in said first position;
in said second position the resiliently deformable article being foldingly deformed sufficiently to be received in a pocket; said elongated second arm, said elongated first arm, and said elongated support each being adapted to constrain expansion of the resiliently deformable article and to frictionally grip the resiliently deformable article;
said elongated second arm being movable to a third position spaced further away from said elongated first arm than in said second position, and which is spaced closer to said elongated first arm than in said first position;
the frictional grip on the resiliently deformable article by said elongated first arm, said elongated second arm, and said elongated support being sufficiently reduced in said third position relative to said second position so as to be less than a frictional force between the resiliently deformable article and a pocket;
a center line of said elongated first arm lying generally in a plane of motion defined by said elongated second arm during movement thereof from said first position to said second position;
and said elongated support lying generally within a second plane perpendicular to said plane of motion, said second plane passing between said elongated first arm and said elongated second arm;
in an unstressed condition, said elongated first arm and said elongated second arm are curved along their respective lengths such that their respective free ends are closer together than their respective fixed ends;
and in said second position said elongated first arm and said elongated second arm being stressed away from each other by resistance to deformation of said resiliently deformable article, such that said elongated first arm and said elongated second arm are both substantially straight;
in an unstressed condition, said elongated support is curved along its length toward said plane of motion of said elongated second arm;
and in said second position said elongated support being stressed away from said plane of motion by resistance to deformation of the resiliently deformable article such that said elongated support becomes substantially straight;
at least one of said elongated first arms having a first transverse cross-sectional shape which is generally circular and which occurs from the fixed arm end along said at least one of said elongated arms to a location spaced from the fixed arm end;
the remaining portion of said at least one of said elongated arms having a cross-sectional shape which is concave on one side and convex on the other side;
whereby a resiliently deformable article placed in contact with both the elongated first arm and the elongated second arm in the first elongated second arm position is deformed by movement of the elongated second arm toward the elongated first arm in the second elongated second arm position for insertion into a pocket, the resiliently deformable article being partially released by movement of the elongated second arm to a third position so that frictional resistance between a pocket and the resiliently deformable article, upon removal of the pocket, causes the pocket to retain the resiliently deformable article; and
whereby during a folding operation on the resiliently deformable article between the elongated first arm and the elongated second arm, the folded portion of the resiliently deformable article abuts the elongated support so as to be in frictional contact therewith.

4,517,724
SEAMING TOOL

Elmer M. Gee, 2381 23rd St., Wyandotte, Mich. 48192
Filed Jul. 11, 1983, Ser. No. 512,393
Int. Cl.³ B25B *27/02*
U.S. Cl. 29—275 **4 Claims**



1. A tool for seaming together sheet metal panels wherein a first panel includes a flange forming a right angle with respect to said first panel and a second panel forming a flange receiving channel, said first and second panels oriented at right angles to one another when assembled, said tool comprising,
a guide member forming a bottom surface and forming an open channel extending between a first and second end of said guide member, said guide member having a guide plate located at said first end, said guide plate oriented at a right angle with respect to said bottom surface and extending laterally away from said guide member,
an elongated driving lever having a first and second end and having an upright plate located near said first lever end and a striking head attached to said upright plate, and
pivot means pivotably supporting said driving lever at said second end of said driving lever said driving lever pivotably movable within said channel such that when said guide member bottom surface is brought into contact with

said first panel and said guide plate contacts said second panel, a force applied to said striking head is transmitted to said flange through contact therewith causing said first panel flange to be forced into said second panel channel.

4,517,725

METHOD AND APPARATUS FOR FORMATION OF PACKS OF PUNCHED PLATES USEFUL FOR SPARK EXTINGUISHING

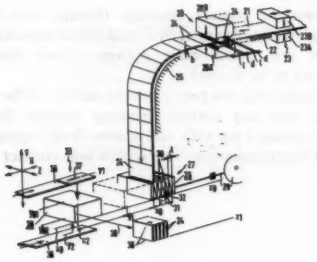
Reiner Augenstein, Halblech/Füssen, Fed. Rep. of Germany, assignor to Otto Bihler Maschinenfabrik GmbH & Co. KG, Halblech/Füssen, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,234

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1982, 3201401

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—417 **33 Claims**



1. A method for continuously forming individual packs of punched plates particularly for use in spark extinguishing comprising the steps of:

intermittently advancing elongate sheet material to a punching station;

punching from said sheet material at said punching station in a single punching operation a number of punched plates sufficient to form one of said individual packs;

continuously moving said punched plates as an uninterrupted series with mutually abutting terminal edges to a formation member with a feed velocity for forming said number of punched plates into a pack and sequentially depositing said punched plates into said formation member during a pack forming operation; and

continuously moving said formation member with a pack forming speed during said pack forming operation through a given advancing distance in a direction which is essentially perpendicular to the direction in which said punched plates are deposited into said formation member, said feed velocity and said pack forming speed being interdependently controlled such that subsequent plates of said series are arranged side face by side face in the respective pack.

4,517,726

METHOD OF PRODUCING SEAL RING

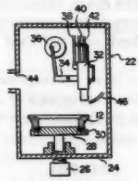
Naohiko Yokoshima, 2-3-8 Miyanosaka; Nobuyoshi Masumoto, 5-5-1208 Kuzuha-hanazono-cho, and Akira Sui, 2-2-20 Ueno, all of Hirakata-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 140,442, Apr. 17, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,378

Int. Cl.³ B23P *17/04*

U.S. Cl. 29—527.4 **6 Claims**

1. A method of producing a seal ring for a floating seal assembly, comprising: forming a seal ring base from a low carbon steel, said seal ring base having an external tapered surface and a sealing portion formed thereon; plasma spraying a cermet material containing WC and Ni on the sealing portion of said seal ring base to form a coated layer of the cermet material thereon using a plasma gun having a tip, the cermet material to be plasma sprayed being introduced at a position outside of said tip of said gun and being semi-fused by a plasma jet before impinging on the sealing portion while carefully controlling a distance between the plasma gun and the sealing



portion so that the coated layer has a porosity of 1% or less; and lapping said coated layer to obtain a finished seal ring product having a plasma sprayed and lapped coating of the cermet material on the sealing portion.

4,517,727

METHOD OF PRODUCING A POROUS BODY FOR ELECTROLYTIC CAPACITOR HAVING A LEAD WIRE

Shigeaki Shimizu; Yoshimi Kubo; Yoshio Arai; Tetsuo Suzuki, and Hitoshi Igarashi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 509,153

Claims priority, application Japan, Jun. 28, 1982, 57-111102

Int. Cl.³ H01G *9/04, 9/05*

U.S. Cl. 29—570 **8 Claims**

1. A method for producing a porous sintered body for an Al-Ti solid electrolytic capacitor equipped with a lead wire, comprising steps of subjecting a titanium wire to a nitriding treatment, embedding said wire into a mixture of aluminum powder and titanium powder, press-molding the mixtureof said powders with said wire, an sintering the resulting press-molded article.

4,517,728

MANUFACTURING METHOD FOR MIS-TYPE SEMICONDUCTOR DEVICE

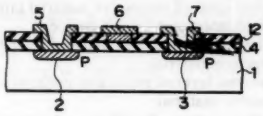
Morihiro Niimi, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 342,651, Jan. 25, 1982, abandoned. This application Dec. 8, 1983, Ser. No. 559,399

Claims priority, application Japan, Jan. 27, 1981, 56-9627

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **19 Claims**



16. A manufacturing method for an MOS-type semiconductor device which comprises:

forming a first oxide layer, a polycrystalline semiconductor layer and a second oxide layer in that order on a semiconductor substrate;

selectively and partially removing said second oxide layer to form windows for source, gate and drain;

forming a nitrified layer so as to cover said second oxide layer and said windows;

removing said nitrified layer except that covering the window for the gate;

removing said polycrystalline semiconductor layer in regions corresponding to said windows for the source and the drain;

removing said second oxide layer;
removing said first oxide layer in said source and drain windows;
forming a doped source region and a doped drain region in the semiconductor substrate and adjacent to the windows for the source and the drain, respectively and converting the remaining polycrystalline semiconductor layer to an insulator except where said nitrified layer is in contact therewith; and
removing said nitrified layer corresponding to the window for gate and providing the respective drain windows with a source electrode, a gate electrode and a drain electrode.

4,517,729

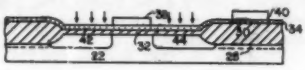
METHOD FOR FABRICATING MOS DEVICE WITH SELF-ALIGNED CONTACTS

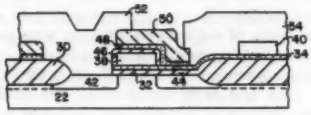
Tarsaim L. Batra, Cupertino, Calif., assignor to American Microsystems, Incorporated, Santa Clara, Calif.

Continuation-in-part of Ser. No. 287,388, Jul. 27, 1981, Pat. No. 4,466,172, which is a continuation-in-part of Ser. No. 1,840, Jan. 8, 1979, abandoned. This application Sep. 22, 1982, Ser. No. 421,543

Int. Cl.³ H01L *21/283, 21/318, 29/78, 21/225*

U.S. Cl. 29—571 **17 Claims**





1. A method for fabricating an integrated circuit semiconductor device having a plurality of field effect transistor (FET) elements with self-registering electrical contacts on their source-drain regions and on their device interconnection lines, said method comprising the steps of:
forming a patterned layer of field oxide on a semiconductive substrate of a first conductivity type
to form active areas free from field oxide on the substrate surface for the formation of said FET elements;
forming a relatively thin gate dielectric layer within said active areas;
forming a first layer of protective material covering the top of each said integrated circuit device;
forming a layer of conductive material over the surface of said protective material;
forming a second layer of protective material over said layer of conductive material;
removing that portion of said second layer of protective material except over parts of to-be-formed interconnection lines where electrical contacts are intended;
patterning said layer of conductive material into conductive gate electrodes over said active areas and into interconnection lines over said field oxide regions;
removing said first layer of protective material except those portions of said first protective layer which lie above to-be-formed source-drain regions to which electrical contacts are to be made;
removing that portion of said gate dielectric which is exposed;
forming, within each said active area where said gate dielectric has been removed, doped silicon source-drain regions of a second conductivity type material opposite to said first conductivity type, the boundaries of said source-drain regions being determined by the edge of said field oxide and by the edges of said gate electrodes;
forming a relatively thick third layer of protective material over all exposed areas of said substrate and of said layer of conductive material;
removing the remaining exposed portion of said first protective layer, and the remaining portion of said second protective layer;
removing that portion of said gate dielectric layer which is exposed;
forming, within each said active area where said gate dielectric has been removed, doped silicon source-drain regions of a second conductivity type material opposite to said first conductivity type, the boundaries of said source-drain regions being determined by the edge of said field oxide and by the edges of said gate electrodes;
forming a fourth layer of protective material over the entire device;
forming oversized contact openings through said fourth layer of protective material over said interconnection line and over said source-drain regions where electrical contacts are to be formed;
forming a conductive line pattern on the surface of the wafer extending into said contact openings thereby forming electrical connections with said source-drain regions and with said interconnection lines within said contact openings.

4,517,730

METHOD OF PROVIDING A SMALL-SIZED OPENING, USE OF THIS METHOD FOR THE MANUFACTURE OF FIELD EFFECT TRANSISTORS HAVING AN ALIGNED GATE IN THE SUBMICRON RANGE AND TRANSISTORS THUS OBTAINED

Didier S. Meignant, Emerainville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,353

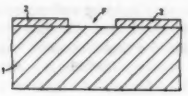
Claims priority, application France, Sep. 1, 1982, 82 14944

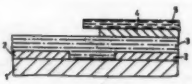
Int. Cl.³ H01L *39/22*

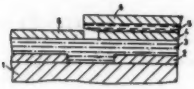
U.S. Cl. 29—571 **9 Claims**

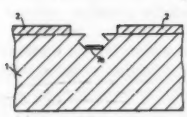
1. A method of providing a small-sized opening in a substrate, characterised in that the following succession of steps is carried out:
(a) depositing on the substrate a layer of a first lacquer sensitive to radiations of small wave-length, a first layer of a material opaque to these radiations and a layer of a second lacquer sensitive to radiations of larger wave-lengths;
(b) exposing an entire zone of said substrate thus coated to radiation of a larger waver-length through a mask;
(c) dissolving the exposed part of said second lacquer;
(d) attacking said first layer of opaque material not coated with said second lacquer until an under-etching is obtained below said second lacquer over a distance typically less than 1 μm;
(e) depositing a new layer of opaque material by alignment along the exposed edge of said second lacquer;
(f) dissolving remaining portions of said second lacquer;
(g) exposing said layer of first lacquer to radiation of small wave-length;

(h) dissolving said first lacquer exposed to said radiation of small wave-length;









(i) etching said substrate to obtain a small-sized opening; and

(j) dissolving remaining portions of said first lacquer.

4,517,731

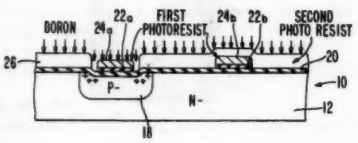
DOUBLE POLYSILICON PROCESS FOR FABRICATING CMOS INTEGRATED CIRCUITS

Mahboob Khan, Milpitas, and Tom Trieu, San Jose, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Sep. 29, 1983, Ser. No. 537,188

Int. Cl.³ H01L *21/265, 21/31*

U.S. Cl. 29—571 **10 Claims**



1. In a process for fabricating complementary field effect transistors (FET) wherein a first FET is formed in a well of first conductivity type in a semiconductor substrate of opposite conductivity type, a method for enhancing the field threshold of the first FET comprising:

forming a first layer of insulating material over the well;

forming a second layer of insulating material over a selected portion of the first layer, the selected portion being disposed over the well, but spaced apart from opposing sides of the well;

forming masking material over all of the second layer, and all of the first layer except an intervening region of the first layer between the selected portion and the opposing sides of the well; and

introducing first conductivity type impurity into the intervening region.

4,517,732

METHOD FOR FABRICATING AN EEPROM

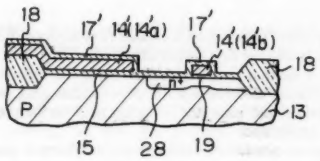
Yoshihiro Oshikawa, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

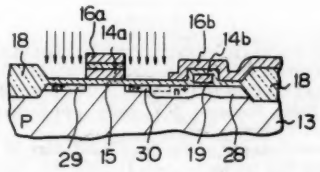
Filed Oct. 4, 1983, Ser. No. 538,884

Claims priority, application Japan, Oct. 5, 1982, 57-174776

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **6 Claims**





1. A method for fabricating a floating-gate tunnel injection type electrically erasable programmable read only memory, including the steps of:

forming an insulating layer on a semiconductor substrate;

forming a floating gate extending onto the insulating layer, the area under the floating gate defining a tunneling insulating layer; and then

introducing a doping impurity into first and second regions of the substrate, the second region of the substrate comprising the entire region under the tunneling insulating layer on which the floating gate is formed, the first region of the substrate neighboring the second region of the substrate, the doping impurity being introduced into the second region through the first region from above the substrate.

4,517,733

PROCESS FOR FABRICATING THIN FILM IMAGE PICK-UP ELEMENT

Toshihisa Hamano, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 336,991, Jan. 4, 1982, Pat. No. 4,471,371. This application Feb. 22, 1984, Ser. No. 582,642

Claims priority, application Japan, Jan. 6, 1981, 56-162; Jan. 12, 1981, 56-2111

Int. Cl.³ H01L *27/14, 49/02, 21/425*

U.S. Cl. 29—572 **5 Claims**

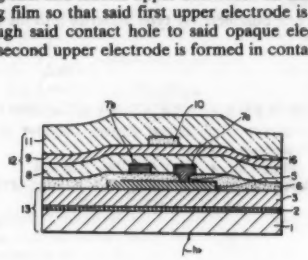
1. A process for fabricating a thin film image pickup element comprising the steps of:

forming at least a first semiconductor layer on a transparent electrode by glow discharging in ohmic contact with said transparent electrode;

forming an opaque electrode on a portion of said at least first semiconductor layer in ohmic contact with said semiconductor layer;

covering a first insulator film with a contact hole therein on said opaque electrode by photolithography;

forming first and second upper electrodes on said first insulating film so that said first upper electrode is connected through said contact hole to said opaque electrode and said second upper electrode is formed in contact with the



upper surface of said first insulator film adjacent but not in contact with said first upper electrode;

covering a further semiconductor layer on said first and second upper electrodes by a glow discharging process;

covering a second insulator layer on said further semiconductor layer; and

forming on a portion of said second insulator a gate electrode for controlling the conduction of a current channel from said first upper electrode to said second upper electrode.

4,517,734

METHOD OF PASSIVATING ALUMINUM INTERCONNECTS OF NON-HERMETICALLY SEALED INTEGRATED CIRCUIT SEMICONDUCTOR DEVICES

Jacob D. Rubin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 377,288, May 12, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,266

Int. Cl.³ H01L *21/88, 21/92, 21/94, 21/56*

U.S. Cl. 29—577 C **3 Claims**

1. In a process of manufacturing a semiconductor device including the steps of forming circuit elements in the body of a semiconductor substrate, depositing an aluminum layer on said circuit elements to form an interconnect pattern for an integrated circuit die, and bonding wires to said integrated circuit die to provide electrical access to said interconnect pattern, a method of passivating said aluminum layer comprising the step of immersing said wire-bonded integrated circuit die in deionized water heated to at least approximately 95° C.

4,517,735

APPARATUS AND METHOD FOR TENSIONING RESISTIVE WIRE

Dennis W. Watkins, King County, Wash., assignor to AirSensors, Inc., Seattle, Wash.

Filed Oct. 28, 1983, Ser. No. 546,368

Int. Cl.³ H01C *17/28*

U.S. Cl. 29—621 **9 Claims**

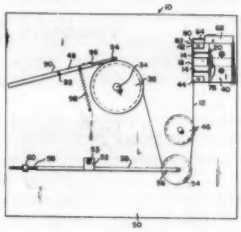
1. An apparatus for use in the attachment of a length of resistive wire under a preselected tension to wire-supporting end portions of a pair of generally parallel, resilient posts attached to a post support member, comprising:

a spindle for rotatably supporting a spool containing a substantially continuous supply of said resistive wire from which said length of resistive wire to be attached to said resilient posts is obtained;

a brake for applying a rotational drag on said spool at least as great as said preselected tension;

a gravity-actuated tension arm for applying said tension to a portion of the continuous resistive wire extending from said spool, said arm engaging the extending portion of continuous resistive wire and being supported for pivotal motion in a substantially vertical plane, said arm having an adjustable weight for adjusting said preselected tension applied to the wire;

a retainer for releasably holding said post support member to position said pair of resilient posts in a desired location and planar orientation for attachment of said length of resistive wire, said retainer including a first wire guide for positioning of said length of resistive wire substantially transverse to said resilient posts, and further including a lockably adjustable holder for holding said support mem-



ber and selective longitudinal positioning of said wire-supporting end portions relative to said length of resistive wire;

a pair of releasable wire clamps, one of said clamps being positioned to the outside of each of said posts for selectively clamping said extending portion of said continuous resistive wire;

a second wire guide for positioning of said length of resistive wire in substantially coplanar relation to said resilient posts; and

a tension gauge for measuring the tension on said extending portion of said continuous resistive wire.

4,517,736

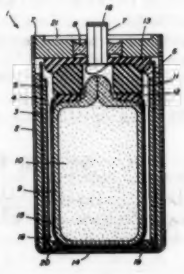
METHOD OF FABRICATION OF AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Communications Products Corp., Stamford, Conn.

Filed Mar. 21, 1984, Ser. No. 591,745

Int. Cl.³ H01M *2/12*

U.S. Cl. 29—623.2 **8 Claims**



1. A method for fabricating an electrochemical cell comprising the steps of:

providing a cylindrical housing opened at one end and closed at the other end;

arranging within said housing a concentric arrangement of a porous carbon element, a porous separator and a lithium sheet, and a conductive jumper element connected to said sheet with said porous carbon element abuting said housing;

inserting a container containing a quantity of concentrated electrolyte solution composed of a solute and a first solvent into the center of said concentric arrangement;

providing a cap with a hollow feedthrough member supported by a non-conductive seal;

attaching said jumper element to said feedthrough member;

sealing said cap to the free end of said housing;

introducing a quantity of a second solvent to the interior of said housing through said feedthrough member; and

sealing said feedthrough member.

4,517,737

APPARATUS FOR SECURING CONNECTORS TO A FABRIC

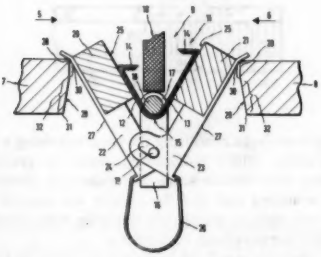
Walther Sulzle, Rosenfeld, Fed. Rep. of Germany, assignor to Wilhelm Sulzle, Rosenfeld, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,415

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219767

Int. Cl.³ B23P *19/00, 11/00*

U.S. Cl. 29—798 **4 Claims**



1. An apparatus for securing a V-shaped connector, having legs of unequal length and inwardly projecting tips, to a flat woven fabric which comprises: a pair of primary jaws; a secondary jaw assembly having a pair of arms pivotally connected by a pivot pin which passes through an elongated slot in each of said arms, said slots permitting said arms to be spaced apart when they are parallel to each other; and a pair of secondary jaws connected to said arms and adapted to press against the legs of said connector; each of said primary jaws having an inner face, said inner face having an upper flat region, said upper flat region being parallel to each other; and wherein said inner face has a lower region inclined outwardly; whereby said upper and lower regions cooperate with said arms to cause to draw together in a predetermined manner when said primary jaws are closed.

4,517,738

METHOD FOR PACKAGING ELECTRONIC PARTS

Yoshitaka Fukuoka, and Toshiaki Komine, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 14, 1983, Ser. No. 484,987

Claims priority, application Japan, Apr. 24, 1982, 57-68931

Int. Cl.³ H05K *3/34*

U.S. Cl. 29—840 **11 Claims**

1. A method for packaging electronic parts, comprising the steps of:

forming a ring-shaped welding rib on a multilayer substrate having conductor portions so as to surround those conductor portions over which the electronic parts are to be mounted in a later step;

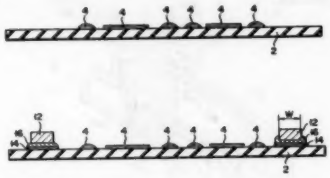
forming a nonmetallic mask coating on a portion of the welding rib which is subjected to laser radiation in a subsequent step and which extends along the entire circumference of the welding rib;

forming metal films by nonelectrolytic plating on the exposed portion of the welding rib and on the conductor portions;

removing the mask coating, thereby providing a portion of the welding rib which is not covered with the metal film;

mounting the electronic parts on the metal films on some of the conductor portions;

mounting a cap on the welding rib such that a peripheral portion of the cap is placed on the portion of the welding



rib which is not covered with the metal film, the cap having an outer shape substantially the same as the welding rib; and

radiating a laser beam on the contact portion between the welding rib and the peripheral portion of the cap to weld the welding rib and the peripheral portion together, thereby hermetically sealing the electronic parts within a space defined by the multi-layer substrate and the cap.

4,517,739

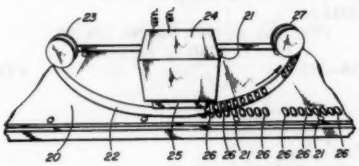
METHOD FOR MAKING CIRCUIT BOARDS WITH DIE STAMPED CONTACT PADS AND CONDUCTIVE INK CIRCUIT PATTERNS

George V. Lenaerts, London; Eugene W. Charchanko, Thorndale, and Andrejs Dambenieks, Carp, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 21, 1983, Ser. No. 553,499

Int. Cl.³ H05K *3/10*

U.S. Cl. 29—846 **2 Claims**



1. A method of making circuit boards, comprising:

feeding a strip of dielectric material along a support surface;

locating said strip of dielectric material by locating means in said strip;

feeding said strip of dielectric material and a strip of copper foil beneath the die of a press, and actuating said die to stamp contact pads from said foil and press the contact pads on said strip of dielectric material at predetermined positions;

removing the foil strip from the strip of dielectric material;

feeding the strip of dielectric material beneath a press having a heated pad and bonding said contact pads on to said strip of dielectric material, feeding the dielectric strip beneath a printing head and printing a circuit pattern on the dielectric material, the circuit pattern connecting with said contact pads; and

feeding the dielectric strip to a press, forming holes through said contact pads and said dielectric material, and cutting individual circuit boards from said strip.

4,517,740

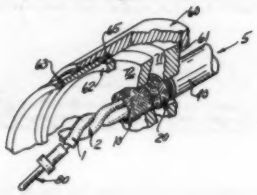
METHOD FOR GROUNDING AND TERMINATING A CABLE

John W. Dyce; Edwin R. Waters, both of Sidney, and Cy E. Sherwood, Bainbridge, all of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 383,889, Jun. 1, 1982, Pat. No. 4,447,100. This application Dec. 12, 1983, Ser. No. 560,622

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—857 **3 Claims**



1. A method of grounding and terminating a cable of the type having at least one wire surrounded by an inner and outer metal shield, an inner jacket of dielectric material between the shields and an outer jacket of dielectric material surrounding the outer shield, the method comprising the steps of:

stripping material from the inner and outer jackets to expose a portion of the inner and outer shields;

placing a ferrule around the cable and in contact with the outer shield;

folding the inner shield back over the inner jacket and over a portion of the exposed outer shield; and

captivating said ferrule within a connector housing whereby said shields are grounded together and the ferrule provides a strain relief for an axial force applied to said cable.

4,517,741

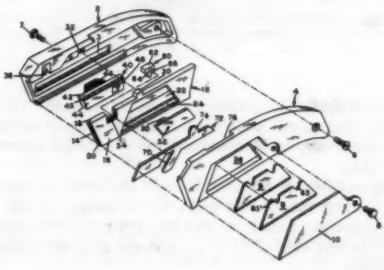
KNIFE WITH PLURAL REPLACEABLE BLADE STORAGE AND MEANS FOR SINGLE BLADE EXTENSION

James M. Castelluzzo, 188 Avenue of the Americas, New York, N.Y. 10013

Filed May 19, 1982, Ser. No. 379,900

Int. Cl.³ B26B *21/24, 1/08*

U.S. Cl. 30—162 **4 Claims**



1. A utility knife having a handle, a recess in the handle for receiving a stack of knife blades, a knife blade guide in said handle parallel to said recess for receiving a knife blade from said recess, said guide having an opening in one wall thereof for guiding a received knife blade from said recess to a knife end of said handle, magnetic means for attracting at least an innermost blade of said stack of knife blades into alignment with said knife blade guide and for holding said innermost blade in such alignment, and follower means slidable in said handle parallel to said blade guide, means for sliding said follower means in said blade guide, said follower means including means for engaging and sliding said innermost blade of said stack of knife blades in said handle along said knife blade guide and for projecting the end of said innermost blade at the knife end of said handle and means for locking the blade in a projected position in said handle.

4,517,742

APPARATUS AND METHOD FOR CORRECTING ERRORS IN A LENGTH OR ANGLE MEASURING SYSTEM

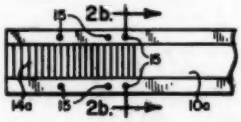
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 494,109

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3224005

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 C **21 Claims**



1. In a length or angle measuring device comprising a planar graduation carrier, which includes a measuring graduation, and a scanning unit, which scans the measuring graduation, wherein the scanning unit and the carrier are adapted to be coupled to two objects which are movable with respect to each other, the improvement comprising:

means for applying localized longitudinal forces to the carrier independently of any externally applied forces, which localized longitudinal forces are exerted parallel to a plane defined by the carrier and are variable along the longitudinal extent of the carrier to cause localized variations in the length of the carrier substantially without deflection of the carrier transverse to said plane, in order to bring about nonlinear length variations in the graduation in accordance with a desired error correction course.

15. In a length or angle measuring device comprising a graduation carrier, which includes a measuring graduation, and a scanning unit, which scans the measuring graduation, wherein the scanning unit and the carrier are adapted to be coupled to two objects which are movable with respect to each other, the improvement comprising:

means, included in the carrier, for developing a preset longitudinal force in the carrier; and

means for varying the preset longitudinal force in the carrier along the longitudinal extent of the carrier to cause localized variations in the length of the carrier in order to bring about nonlinear length variations in the graduation in accordance with a desired error correction course.

4,517,743

GAUGE

Rudolf Och, Nuremberg, Fed. Rep. of Germany, assignor to Frenco Verzahnungslehren GmbH, Nuremberg, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 452,018

Int. Cl.³ G01B *5/08, 5/12*

U.S. Cl. 33—147 M **16 Claims**

1. A gauge, particularly for inspecting and indicating the quality of gear teeth on a workpiece, comprising

a hollow elongated member having an axis and a leading end portion provided with inner and outer circumferential surfaces;

a set of gauging teeth on at least one of said surfaces and

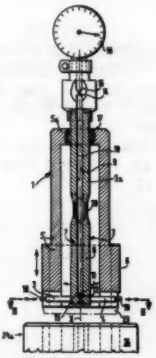
shaped and dimensioned to mate precisely with the teeth to be inspected on a workpiece;

a test element located within the confines of said one surface and having at least one component movable into and out of testing engagement with a tooth on the workpiece;

said one surface having at least one slot extending in lengthwise as well as in radial direction of said axis; and

means mounting said test element so that said component is located in said slot with freedom of movement in at least one of said directions.

14. A gauge, particularly for inspecting and indicating the quality of gear teeth on a workpiece, comprising a hollow member having an axis and including a circumferential wall



having an outer surface, a discrete ring part surrounded by said wall, and an annular member surrounded by said ring part and having an inner surface; a set of gauging teeth provided on said inner surface and shaped and dimensioned to mate precisely with the teeth to be inspected on a workpiece; a test element located within the confines of said inner surface and having two components movable into and out of testing engagement with a tooth on the workpiece, said inner surface having two slots extending in lengthwise as well as in radial direction of said axis and being located opposite each other with reference to said axis; and means mounting said test element so that each of said components is located in a different one of said slots with freedom of movement in at least one of said directions.

4,517,744

COMPLIANT ASSEMBLY SYSTEM WITH FORCE SENSOR MEMBERS

Emanuel J. Consales, Winchester, and Anthony Kondoleon, Tewksbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

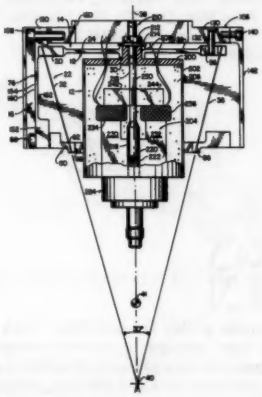
Filed Feb. 21, 1984, Ser. No. 581,796
Int. Cl.³ G01B *5/25, 7/31*
U.S. Cl. 33—169 C **6 Claims**

1. A compliant assembly system comprising:

a remote center compliance device having first and second interconnected compliant sections, said first compliant section being interconnected with a support member;

a tool holder mechanism disposed within said remote center compliance device and interconnected with said second compliant section; and

a force sensor system including a plurality of sensor members adjacent to said remote center compliance device and extending from said support member to a mounting frame, each said sensor member including at least one force



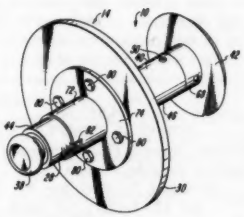
sensor for sensing the force applied through said tool holder mechanism and remote center compliance device.

4,517,745

APPARATUS FOR MEASURING THE SHOULDER OF A DRILL PIPE JOINT

Bruce L. Hare, E. Star Rte. 3, Box 53, Bloomfield, N. Mex. 87413, assignor to Bruce L. Hare, Jr., Bloomfield, N. Mex.

Filed May 2, 1983, Ser. No. 490,785
Int. Cl.³ G01B *5/18, 5/16*
U.S. Cl. 33—169 B **6 Claims**



1. A gauge for measuring the squareness and length remaining for grinding of an outer shoulder of a box end of an internally threaded oil drill pipe shoulder of a box end of an internally threaded oil drill pipe having a bore formed therethrough, said oil drill pipe having a throat therein forming a transition area between said internal threads and said bore, comprising in combination:

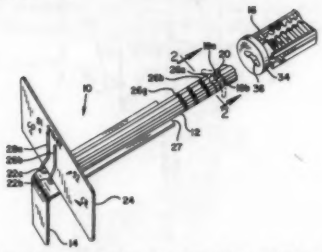
an elongated generally cylindrically shaped insert received by said open throat and coaxial with an axis of said pipe including an end cap releasably connected to an elongated body of said insert at an innermost end thereof, said end cap conformable to and seated against said throat, said elongated body connected to a handle at an outermost end of said body; and

an indicator slideable along said elongated body of said insert, said indicator including a tube slideable along said body, said tube having connected thereto and extending perpendicularly therefrom, an annular flange directed outwardly from the axis abuttable against said outer shoulder.

4,517,746
METHOD AND APPARATUS FOR DECODING WAFER COMBINATION LOCKS

Thomas E. Easley, 1303 Fourth St., La Grande, Oreg. 97850

Filed May 31, 1983, Ser. No. 499,275
Int. Cl.³ G01B 5/20
U.S. Cl. 33—549 6 Claims



1. An elongate probe, for decoding a lock of the wafer combination type, adapted to slidably engage an elongate keyway cylinder having a plurality of wafers therein of different physical configurations and different orientations distributed along the length of said keyway at spaced positions, said probe having detecting means for detecting at each wafer position in said keyway cylinder the presence, physical configuration and orientation of each wafer therein said detecting means comprising elongate rotatable means mounted within said probe for rotation about an axis extending longitudinally of said probe for making contact with portions of said wafers.

6. A method of decoding a lock of the wafer combination type, having a plurality of wafers therein of different physical configurations and different orientations distributed along the length of an elongate keyway cylinder at spaced wafer positions, without removing the lock from its fixed surroundings comprising the steps:

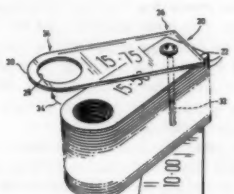
(a) inserting into said keyway cylinder an elongate probe adapted to slidably engage said keyway cylinder; and

(b) detecting through said probe, at each wafer position in said keyway cylinder, the presence, physical configuration and orientation of each wafer therein by moving a portion of said probe transversely to the length thereof into contact with a portion of each of said wafers.

4,517,747
CORNEAL TEMPLATE SET

J. Donald Morin, Toronto, Canada, assignor to The Hospital For Sick Children, Toronto, Canada

Filed Jun. 22, 1983, Ser. No. 506,748
Int. Cl.³ G01B 3/34; A61B 3/00
U.S. Cl. 33—178 B 6 Claims



1. A device for use in corneal size measurement comprising:

a set of individual templates each in the form of a relatively thin and flexible blade of transparent, sterilizable plastic material, the blade having first and second ends and being formed with a sharply defined circular opening extending through the blade adjacent said first end thereof, the blade being rounded in elevation and smooth at said first end so as to present a substantially non-injurious surface to the cornea in use;

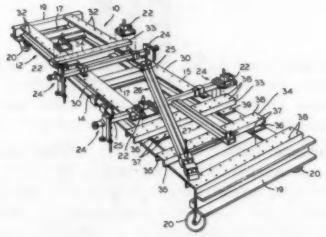
said blades being of substantially identical overall size and external shape and being arranged in a stack in which the blades are disposed in parallel planes with their respective second ends superimposed and coupled together by a common pivot pin which extends through the stack while allowing individual pivotal movement of each blade about said pin with respect to the other blades;

the openings in the respective blades being of graduated size in predetermined increments from one end of the stack to the other and each blade being visibly marked to indicate the size of the opening in that blade.

4,517,748
MEASURING BRIDGE FOR DETERMINING MOTOR VEHICLE DAMAGE

Ronald M. Rudolph, 3604 Ea. Garden Pl., Oak Creek, Wis. 53154, and Daniel P. Wendl, W225 S4569 Guthrie Rd., Waukesha, Wis. 53186

Filed Feb. 21, 1984, Ser. No. 581,966
Int. Cl.³ G01B 5/14, 5/25
U.S. Cl. 33—180 AT 7 Claims



1. A measuring bridge including a main frame defining a reference plane,

indexing means on said frame and defining coordinates in said plane,

a plurality of support assemblies,

coupling means for securing each support assembly in a discreet location relative to said reference plane and spaced a predetermined distance from each of the other support assemblies, said support assemblies each being adapted to be engaged by one of a plurality of datum points on the under side of a vehicle for supporting said vehicle in a predetermined orientation relative to said reference plane and the coordinates therein,

first and second portable gauge means releasably mountable on said frame for determining the relative position of datum points on damaged portions of said vehicle relative to a reference datum point,

said first portable gauge means including elongate bar means, first means for securing said first bar means to the indexing means of said main frame whereby said first bar means is fixed in said plane and lies in parallelism with the center line of the vehicle, a first measuring device slideably mounted on said first bar means and having an elongate measuring element mounted thereon for movement in a direction normal to the vehicle center line,

said second portable gauge means including elongate beam means, second means for releasably securing said beam means on said main frame independently of said indexing means, said beam means being rotatably mounted about said second means,

a second elongate measuring element mounted on said beam means for vertical movement in a direction normal to said

reference plane for locating a first datum point below said vehicle,

a second measuring device slideably mounted on said beam means and having a third measuring element mounted thereon for movement in a direction normal to said reference plane,

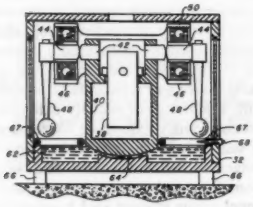
said beam means being pivotal into engagement with the end of said first elongate measuring element thereby locating said third elongate element in predetermined coordinates relative to said reference plane with the elevation of the upper end of said third elongate element three dimensionally locating a second datum point below said vehicle relative to said first datum point and to said reference plane.

4,517,749

STABLE PLUMB BEAM OPTICAL PROJECTOR

Dominick P. Scotto, Plainview, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,314
Int. Cl.³ G01C *9/15*
U.S. Cl. 33—346 **13 Claims**



1. A plumbing device comprising:

a housing having an aperture through one surface thereof;

first pendulum means pivotally coupled to said housing for pendulous movement therewithin about a first axis;

second pendulum means having a preselected mass and positioned within said housing for pendulous movement therewithin about said first axis;

a first flexural pivot having first means for coupling to said first pendulum means and second means for coupling to said second pedulum means, said first flexural pivot operable at a torsional spring rate determined by said preselected mass; and

means linearly positioned and coupled to said second pendulum means for indicating deviations of said linear positioning from verticality.

4,517,750

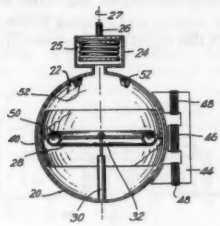
VERTICAL INDICATING METHOD AND DEVICE

Yishay Netzer, 20 Gilboa St., Haifa, Israel (32716)

Continuation-in-part of Ser. No. 275,602, Jun. 22, 1981, Pat. No. 4,451,991. This application Mar. 15, 1984, Ser. No. 590,069
Int. Cl.³ G01C *9/06, 9/08*
U.S. Cl. 33—396 **12 Claims**

1. A generally small, compact verticality sensor of the type having a pendulous element comprising:

a housing and a pendulous element contained therein and immersed in a liquid having a relatively low viscosity; axial means for supporting said pendulous element for rotational movement about two axes of rotation; said pendulous element including means for coupling said pendulous element to said liquid; said means for coupling being for substantially increasing the moment of inertia of said pendulous element without increasing the loading on said axial means, whereby the ratio of the effective length relative to themechanical dimensions of said pendulous element is increased and angular electrical pick-off means associated with said pendulous element for providing an electrical signal proportional to the angular tilt of said



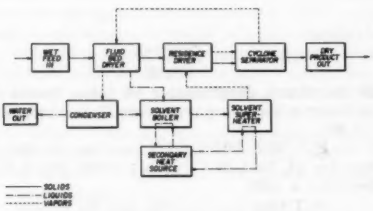
pendulous element about said two axes relative to said housing.

4,517,751

AZEOTROPIC DRYING PROCESS

Steven L. Ross, Chagrin Falls, and Otto H. Tachovsky, Solon, both of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Filed Jun. 17, 1983, Ser. No. 505,409
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—10 **9 Claims**



1. A process for drying a continuous stream of moisture-laden feedstock, comprising the steps of:

introducing said feedstock stream into a fluid bed dryer in which is maintained an atmosphere of water-azeotrope forming solvent vapors and maintaining said feedstock in said fluid bed dryer for a time sufficient to allow the formation of azeotropes between the moisture of said feedstock and said solvent vapors;

passing said feedstock through a residence dryer which is provided with superheated vapors of said solvent, thereby removing any residual solvent and moisture from said feedstock stream;

passing said feedstock stream and vapors from said residence dryer to a separator wherein said feedstock stream is separated off from said vapors; and

recovering from said separator an essentially dried and solvent free feedstock stream.

4,517,752

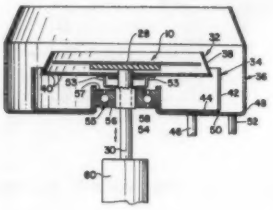
SPLASH RETARDER

Michael J. Devico, Madison, and Gary Hillman, Livingston, both of N.J., assignors to Machine Technology, Inc., Whippany, N.J.

Filed Jun. 27, 1983, Ser. No. 507,927
Int. Cl.³ F26B *17/24*
U.S. Cl. 34—58 **20 Claims**

1. Splash-retarding apparatus, comprising a rotatable work station upon which a workpiece may be positioned, collecting means for collecting liquid discharged from a workpiece posi-

tioned on said work station, said collecting means includes a solid circumferential wall portion surrounding said work station so as to capture liquid discharged by centrifugal force from a workpiece positioned on said work station upon rotation of said work station, and rotating means for rotating said work station such that liquid on a workpiece positioned on said



work station is discharged by centrifugal force toward said circumferential wall portion of said collecting means and for simultaneously rotating said collecting means in the same direction as said work station, whereby the splash of liquid impacting on said circumferential wall portion of said collecting means after its discharge from a workpiece on said work station is retarded.

4,517,753

SHOE

Leslie Rosenbaum, Jungfrudansen 44, Solna, Sweden (171 56), and Robert Alberts, Gummarpsvägen 27, Helsingborg, Sweden (254 84)

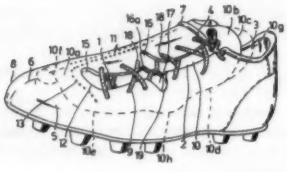
PCT No. PCT/SE81/00231, § 371 Date Apr. 15, 1982, § 102(e) Date Apr. 15, 1982, PCT Pub. No. WO82/00573, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 18, 1981, Ser. No. 375,033

Claims priority, application Sweden, Aug. 18, 1980, 8005898

Int. Cl.³ A43B *5/02*

U.S. Cl. 36—128 **5 Claims**



1. A shoe, particularly a sport shoe, having a side lacing, extending substantially in the longitudinal direction of the shoe on the outside thereof beside, when seen from above, a longitudinal central line of the shoe, extending from the forward central portion of the foot opening to the foremost point of the toe area, said side lacing being formed by a slit extending from the edge of the foot opening in said direction toward the toe area at the outside of the shoe over a part of the shoe's upper, and a tongue covering from below the side lacing and portions of the upper above a user's foot, in which the tongue (**10**) is fastened to the upper (**5**) with a stitching (**11**) located within an area extending substantially about said central line (**6**) at a distance from and along said slit (**2**), and extending, as seen in the longitudinal direction of the shoe, from the forward end (**12**) of said slit toward the foot opening (**3**) over a distance of least one third of the slit's length.

4,517,754

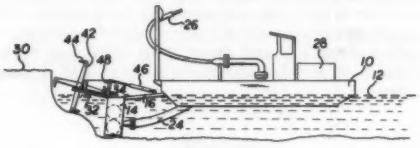
CUTTERHEAD ATTACHMENT FOR A DREDGE

Troy M. Deal, 277 Trismen Ter., Winter Park, Fla. 32789

Filed Mar. 28, 1984, Ser. No. 594,197

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—66 **12 Claims**



1. A dredge suction head comprising, in combination, a cutterhead housing having a front face defining the housing width, an upper portion, and a suction outlet, cutter elements rotatably mounted within said housing front face upon a first horizontally disposed shaft extending across said housing substantially throughout the width thereof, a first motor mounted upon said housing drivingly connected to said shaft supporting said cutter elements, a second horizontally disposed shaft supported forward of and above said front face and extending across the housing width and substantially parallel thereto and to said first shaft, a plurality of radially extending fingers defined on said second shaft extending therefrom, and power means rotating said second shaft in a direction whereby the direction of finger movement below said second shaft is toward said front face and cutter elements and said fingers engage and propel spoils toward said housing front face and cutter elements.

4,517,755

MULTI-TINED CLAW/RAKE ATTACHMENT

Walter Nicholson, Box 917, Port McNeill, B.C., Canada V0N 2R0

Filed Jul. 18, 1983, Ser. No. 515,017

Int. Cl.³ E02F *3/76*

U.S. Cl. 37—117.5 **6 Claims**

1. A tool attachment for a material clearing apparatus having a working arm comprising:

(a) a plurality of forwardly extending elongated curved tines mounted in parallel relationship to each other with substantially unobstructed spaces therebetween and arranged to extend in a direction away from the end of the work arm; a gripping means fixed to the surface of said work arm which faces toward the material clearing apparatus;

(b) support means affixed to a common end of the tines, said support means being connected to the work arm of said apparatus;

(c) means pivotally joining said support means to the end region of said work arm so as to permit said tines to be

moved between an open position in which they extend in a direction away from the end of the working arm and a closed position in which the ends of the tines opposite the support means are proximate to the gripping means carried by the work arm and on the same side of the arm as the material clearing apparatus for holding material between the tines and the gripping means carried by the work arm, said tines and support means pivoting between said open and closed positions as a unit about the end of the work arm and in the same plane as the work arm; and

(d) at least one pointed elongated pushing claw protruding from the side of the tines opposite to the material holding side of the tines and curving in a direction opposite the direction in which said tines are curved.

4,517,756

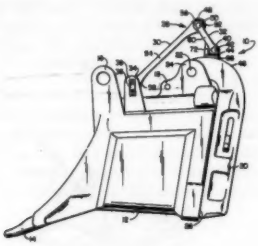
SNUBBER FOR DIPPER DOOR

John R. Olds, Schererville, Ind., and Mark R. Alt, Chicago Heights, Ill., assignors to Abex Corporation, Stamford, Conn.

Filed Jul. 11, 1984, Ser. No. 629,651

Int. Cl.³ E02F *3/46*

U.S. Cl. 37—118 R **7 Claims**



1. A snubber for use with a dipper which includes means defining an opening and a door pivotally connected to the dipper which in one position closes the opening, characterized by the snubber having an elongated member with an elastic working section and an actuator link wherein one end of the member is pivotally connected to the dipper, one end of the link is pivotally connected to the door, and the other end of the member is pivotally connected to the other end of the link, means for preventing pivotal movement of the link in one direction when the door is at a first angle with respect to the means defining the dipper opening to thereby place the elastic working section of the elongated member in tension to retard door movement when the door is moved toward the opening and is at an angle less than the first angle and wherein the elongated member cooperates with the actuator link to define a second angle of the door with respect to the means defining the dipper opening at which the door engages the elongated member and the elongated member is placed in bending to retard door movement when the door is moved away from the opening at an angle greater than the second angle and the elastic working section of the elongated member is unstressed when the door is at an angle with respect to the opening which is between the first and second angles.

4,517,757

ELECTRIC IRON WITH CORD REEL DEVICE

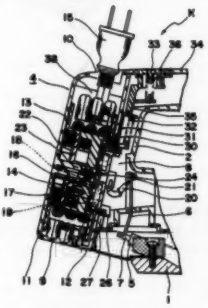
Shuji Asada, Neyagawa, and Tadamasa Nanbu, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 15, 1983, Ser. No. 485,467

Claims priority, application Japan, Apr. 16, 1982, 57-56009[U]; Apr. 16, 1982, 57-56010[U]; Jun. 25, 1982, 57-96089[U]; Feb. 8, 1983, 58-20223

Int. Cl.³ D06F *75/28*

U.S. Cl. 38—88 **12 Claims**



1. An electric iron provided with a cord reel device, comprising a base having a heater incorporated therein, a handle mounted on said base, and a cord electrically connected to said heater, with said cord reel device being arranged to wind said cord thereinto, said cord reel device further comprising:

cord casing means for accommodating said cord therein, said cord casing means having an outlet for said cord;

a drum means for winding said cord therearound, said drum means being provided in said cord casing means;

a spring means for urging said drum means to rotate in a winding direction of said cord;

an electrical means for electrically connecting said cord to said heater;

a locking means for preventing said drum means from rotating in the winding direction of said cord;

a winding button means for causing said drum means to rotate in the winding direction of said cord in association with said locking means, said winding button means being provided flush with or lower than a surface of said handle;

said core reel device being disposed rearward of said handle and having a transparent portion in the cord casing means, such that said cord wound around said drum means is visible from outside of said cord reel device through said transparent portion;

a plurality of fastening members;

said cord casing means having a pair of first cord casing member and a second cord casing member rotatably supporting said drum means from opposite sides thereof;

said first cord casing member and said second cord casing member being secured to each other by said plurality of fastening members;

some of said plurality of fastening members being contained completely within the cord reel device; and

at least one other of said plurality of fastening members being directed inwardly and being fixed beneath an outer surface of the first cord casing member for securing said first cord casing member and said second cord casing member to a rear face of said handle;

whereby, after the cord reel device has been secured to the rear face of the handle, the cord reel device is prevented from being disassembled through inadvertent loosening of the plurality of fastening members.

4,517,758

LIGHT BULB ATTACHED SIGN ASSEMBLY

Marion E. Thompson, 2807 N. Prospect St., Colorado Springs, Colo. 90907

Continuation-in-part of Ser. No. 030,608, Apr. 11, 1979, Pat. No. 4,227,327. This application Apr. 23, 1980, Ser. No. 142,995

Int. Cl.[3] G09F *13/30*

U.S. Cl. 40—431 17 Claims

1. An assembly comprising:

a solar cell;

means for mounting said solar cell directly onto a light bulb so that said cell receives light directly from the light bulb;

a d.c. motor electrically connected to said solar cell and physically attached to said cell and extending from the opposite side thereof as said means for mounting said means for mounting said cell to the light bulb, said motor having a shaft;

a substantially planar sign member having word indicia thereon; and

means for operatively interconnecting said sign member to said motor shaft to rotate in response to motor shaft rotation, said means including a slip swivel connector.

4,517,759

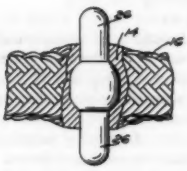
STOPPER FOR BRAIDED LINE

Ronald E. Wall, Voluntown, Conn., assignor to Marine Concepts of America, Davisville, R.I.

Filed Mar. 8, 1984, Ser. No. 587,509

Int. Cl.[3] A01N *73/00*

U.S. Cl. 43—7 4 Claims



1. The method of providing a stopper in a braided line having a core and a braided cover comprising inserting a post-like stopper with a central enlarged portion through the braided cover on one side and into the core with an end protruding substantially diametral of the line on either side thereof whereby the enlargement provided in the line serves as a stopper.

4,517,760

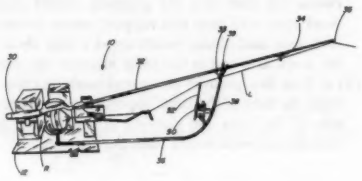
DRIVE MECHANISM FOR FISHING REEL

Jules Randle, P.O. Box 804, Baldwin, La. 70514

Filed Oct. 28, 1983, Ser. No. 546,303

Int. Cl.[3] A01K *97/10*

U.S. Cl. 43—21 5 Claims



1. An automatic rod and reel support carriage apparatus for automatically rotating the reel crank to retrieve a line comprising:

a. a base frame;

b. a motor drive mounted on the frame;

c. a rotating hub having radially spaced means for engaging the reel crank;

d. reel carriage means for holding the reel in a position which engages the reel crank and the hub;

e. moving means loosely engaging the line so that the line can pass therethrough, for actuating the motor drive when the line is tensed such as when a fish pulls the line, the moving means deflecting the line away from the axis of the rod absent tension on the line.

4,517,761

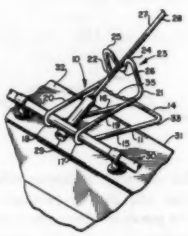
BOAT RAILING MOUNTED FISHING ROD HOLDER

Joseph N. Bleggi, 2216 Parkhaven Dr., Plano, Tex. 75075

Filed Feb. 4, 1983, Ser. No. 463,715

Int. Cl.[3] A01K *97/10*

U.S. Cl. 43—21.2 5 Claims



1 A fishing rod holder mountable on a boat railing and a boat side top comprising: one piece of wire bend formed to shape for the fishing rod holding function desired; said one piece of wire formed with two bottom spaced generally parallel sides, and upwardly extended from said bottom sides, elbow means for capturing the rail of the boat with said elbow means in the form of duplicate elbow bends generally sized to fit a boat railing spaced from and above a boat side top with said bottom spaced parallel sides being support means extending beyond and resting on an outer edge of said boat side top when said holder is mounted on a boat railing and a boat side top for reactively supporting the holder in place without any permanent attachment to the boat; upwardly and rearwardly extending upper sides extending from the tops of said elbow bends generally overlying two bottom spaced generally parallel sides; and at the back ends of said upper sides a cross interconnect back including a "U" shaped portion for receiving and lending support to the shank of a fishing rod with the handle

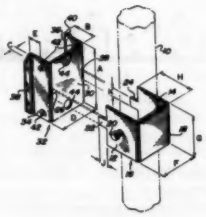
positioned under other structure; wherein the rearwardly extending upper sides are formed with upward bends at the back ends of the upper sides interconnected by an upstanding "M" wire formed shape as said cross interconnect back; and with said "U" shaped portion generally in the middle of said upstanding "M" wire formed shape.

4,517,762

ANIMAL TRAP HOLDER

Louis M. Venetz, 206 Susquehanna Ave., West Pittston, Pa. 18643

Filed Jul. 8, 1983, Ser. No. 511,855
Int. Cl.³ A01M *23/24*
U.S. Cl. 43—96 **8 Claims**



1. In combination, an animal trap holder and a trap, said trap having a pair of spring biased jaws held in spaced relationship when said trap is set and movable away from each other when said trap is sprung, said holder comprising a substantially U-shaped member having first and second leg portions made of sheet material and connected together by an integral base portion, said first and second leg portions each having an outer flat rectangular surface, the sides of said flat rectangular surface being of a distance substantially greater than the thickness of said first and second leg portions, the free ends of said first and second leg portions each having a flange portion extending outwardly therefrom and holding said jaws in contact with a substantial distance on the outer surface of said first and second leg portions when said trap is set and to release said jaws when said trap is sprung, the free ends of said first and second leg portions being manually adjustable toward and away from each other to accomodate different sizes of said trap.

4,517,763

HYBRIDIZATION PROCESS UTILIZING A COMBINATION OF CYTOPLASMIC MALE STERILITY AND HERBICIDE TOLERANCE

Wallace D. Beversdorf; Lawrence R. Erickson, and Ian Grant, all of Guelph, Canada, assignors to University of Guelph, Guelph, Canada

Filed May 11, 1983, Ser. No. 493,511
Int. Cl.³ A01B *79/00;* A01H *5/02*
U.S. Cl. 47—58 **34 Claims**

1. An improved process for forming a substantially homogeneous population of plants of a predetermined hybrid variety of a crop which is capable of undergoing both self-pollination and cross-pollination comprising:

(a) growing in a first planting area a substantially random population of (1) cytoplasmic male sterile plants which exhibit cytoplasmic herbicide tolerance, and (2) male fertile plants which are capable of pollinating said cytoplasmic male sterile plants and which lack cytoplasmic herbicide tolerance, whereby said cytoplasmic male sterile plants (1) and said male fertile plants (2) are pollinated with pollen derived from said male fertile plants and seed is formed on said cytoplasmic male sterile plants and on said male fertile plants,

(b) harvesting in bulk said seed which is formed on said plants of said first planting area,

(c) growing at least a portion of the seed from step (b) in a second planting area in the absence of segregation between the seed derived from said cytoplasmic male sterile plants which exhibit cytoplasmic herbicide tolerance and said male fertile plants which lack cytoplasmic herbicide tolerance, and

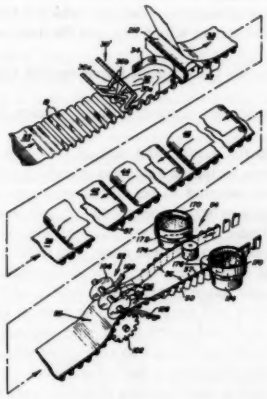
(d) contacting substantially all of the plants present in said second growing area prior to pollination with a herbicide which is effective to destroy said plants resulting from seed formed on said male fertile plants of said first planting area, whereby a substantially homogeneous population of a predetermined hybrid variety is formed which resulted from seed formed on said male sterile plants of said first planting area.

4,517,764

CHAIN OF SOIL PLUGS AND A PROCESS FOR PRODUCING A CHAIN OF SOIL PLUGS

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics, Naperville, Ill.

Filed Feb. 22, 1982, Ser. No. 351,232
Int. Cl.³ B29D *27/04;* A01G *9/10*
U.S. Cl. 47—77 **9 Claims**



1. The product produced by the method comprising the steps of:

conforming a first continuous sheet of cover material (22) to a series of mold elements (14), said material (22) being corrugated when conformed to said mold elements (14);

adding a reaction mixture (32) of soil slurry and polymerizing agent over said first material (22), said slurry being composed of water and suspended solid particulate material and said mixture being curable to form an open-celled elastomeric hydrophilic rooting medium;

adding a second continuous sheet of cover material (38) to the top of said mixture (32);

curing said mixture (32) while applying pressure to said second cover material (38) to conform said mixture (32) within said mold elements (14), said cured mixture forming an open-celled elastomeric hydrophilic rooting medium; and

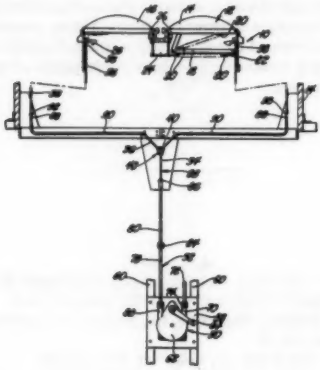
cutting said product longitudinally to form two separate chains of soil plugs.

4,517,765

REMOTELY CONTROLLABLE VENT DOOR

Basil Mucha, Fairless Hills, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Sep. 27, 1982, Ser. No. 423,794
Int. Cl.³ E05F *15/20*
U.S. Cl. 49—3 25 Claims



1. A motion transmitting remote control assembly of the type for transmitting motion in a curved path to open from a remote location at least one vent door which is held in a closed position by latch means which engages the door, said assembly comprising:

cable means for transmitting linear motion along a curved path;

actuator means for actuating linear motion of said cable means;

guide means for guiding the path of said cable means, said cable means including a portion extending from said guide means and adapted to be operatively connected to said latch means whereby operation of said actuator means actuates linear motion of said cable means to disengage the latch means from the vent door, said cable means including a first cable extending from said actuator means and through said guide means and a second cable having two end portions and an intermediate portion therebetween, each of said end portions of said second cable being adapted to be connected to respective ones of a pair of latch means engaging a pair of adjacent vent doors in a closed position; and coupling means for coupling said first cable to said intermediate portion of said second cable, said coupling means including a passageway therethrough, said intermediate portion of said second cable being disposed within said passageway, said coupling means includes a first and second plate member secured together to clamp a portion of said first cable therebetween, at least one of said first and second plate members having a channel therein forming said passageway when said first and second plate members are secured together.

4,517,766

ADJUSTABLE FRICTION SASH HOLDER

Garry P. Haltof, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,441
Int. Cl.³ E05D *13/08*
U.S. Cl. 49—417 7 Claims

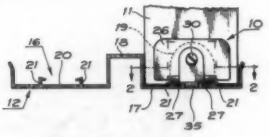
1. An adjustable friction sash holder for use with a sash running in a resin jamb liner having a track in a sash plow region of the sash run of said jamb liner, said track being formed by parallel guides that are L-shaped in cross section to project from said sash run and extend toward each other along opposite sides of said track, said holder comprising:

a. a carriage shaped to fit within said plow region of said sash;

b. said carriage having a pair of runners spaced vertically apart;

c. each of said runners having opposite lateral edges disposed for running along lateral sides of said track, said lateral edges of said runners being interlocked with said L-shaped guides to confine said runners to vertical movement along said track;

d. said carriage having a friction shoe arranged between said runners;



e. said friction shoe being movable relative to said runners to engage a sash run surface of said track between said L-shaped guides;

f. a balance spring connection arranged at an upper region of said carriage;

g. a platform arranged at a lower region of said carriage;

h. said platform being dimensioned to straddle said sash plow region at a lower corner of said sash;

i. an adjustment screw having a head holding said platform;

j. said adjustment screw being threaded into said carriage; and

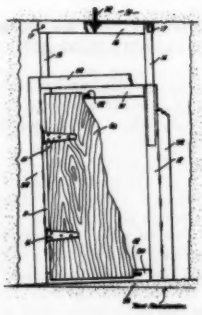
k. an end of said adjustment screw opposite said head engaging said friction shoe so that the threaded advance of said screw variably biases said friction shoe against said track to adjust the friction of said holder within said sash run.

4,517,767

MINE VENTILATION DOOR

Frederick J. Dewson, 66 Koloona Ave., Figtree, New South Wales, Australia 2525

PCT No. PCT/AU82/00031, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/03245, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 17, 1982, Ser. No. 444,897
Claims priority, application Australia, Mar. 18, 1981, PE8036; Nov. 4, 1981, PF1418
Int. Cl.³ E06B *3/32*
U.S. Cl. 49—464 9 Claims



1. A door frame in combination with a doorway frame, said doorway frame comprising:

two upright members spaced apart from each other;

means for selectively adjusting the length of each upright member, and then for clamping said adjusted length; and

a head member extending between said upright members and pivotally connected to each; wherein

said door frame is hingedly mounted to said doorway frame, and comprises at each side an upwardly extending channel having a "U" shaped cross-section, said channels having facing longitudinal openings and being open at their upper end, said channels for receiving side edges of slats or panels extending there between and stacked in top-edge to bottom-edge relationship.

4,517,768

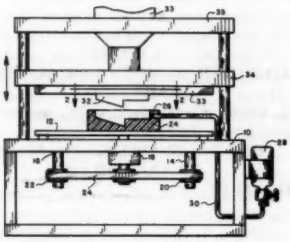
ORBITAL POLISHER

Marten C. Hausermann, Addison, and Elmer P. Hausermann, Bensenville, both of Ill., assignors to Hausermann Abrading Process Company, Addison, Ill.

Continuation-in-part of Ser. No. 474,150, Mar. 10, 1983, Pat. No. 4,493,165. This application Oct. 6, 1983, Ser. No. 539,488

Int. Cl.³ B24B *19/00*

U.S. Cl. 51—58 **3 Claims**



1. Apparatus for polishing workpieces, said apparatus comprising

a base member;

a first platen disposed on and supported by said base member and free to move in any direction in the horizontal plane with respect to said base member;

means coupled to said first platen for driving said first platen in horizontal oscillatory rotary motion with respect to said base member;

a resilient, non-abrasive polishing die fixed to the upper surface of said first platen;

a second platen mounted in a superimposed relation and adapted to be driven vertically with respect to said first platen;

means for mounting a workpiece to said second platen in substantial vertical alignment with said resilient polishing die;

vertical drive means for incrementally infeeding said workpiece and said polishing die into contact with one another while said first platen is driven in horizontal oscillatory motion;

means for injecting an elastic abrasive composition into said polishing die when said workpiece is in contact therewith; and

means for heating said workpiece to a preselected temperature prior to infeeding said workpiece and said polishing die into contact with one another to thereby produce a thermal gradient through said elastic abrasive composition during each infeeding increment.

4,517,769

METHOD AND APPARATUS FOR FORMING OBLIQUE GROOVE IN SEMICONDUCTOR DEVICE

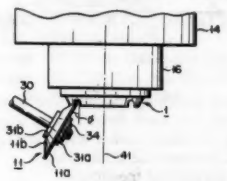
Shigeru Fujimoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 11, 1982, Ser. No. 377,008

Claims priority, application Japan, May 20, 1981, 56-75893; Jan. 20, 1982, 57-7138; Jan. 25, 1982, 57-8882; Jan. 25, 1982, 57-8883

Int. Cl.³ B24B *19/00*; B24D *5/00*

U.S. Cl. 51—105 R **30 Claims**



1. A method of forming a circular oblique groove in a semiconductor device, said method comprising the steps of:

(a) rotating a semiconductor device having an at least approximately planar surface about a first axis passing through said at least approximately planar surface, said first axis being perpendicular to said at least approximately planar surface of said semiconductor device;

(b) rotating a grinding wheel

(i) having a planar forward surface disposed in a plane, said planar forward surface being circular in shape,

(ii) which comprises a first component of truncated cone shape having a first base, a second base which is larger in diameter than the first base, and a conical grinding surface which joins the first and second bases and a second component of disk shape coaxially attached to the second base of said first component without an appreciable gap therebetween, said second component being larger in diameter than the second base of said first component, said planar forward surface of said grinding wheel being the surface of said second component which is remote from said first component,

(iii) about a second axis passing through the center of said planar forward surface of said grinding wheel, said second axis being perpendicular to said planar forward surface of said grinding wheel and the plane including said planar forward surface of said grinding wheel intersecting said first axis at a first angle α which is an acute angle; and

(c) under these conditions, moving said grinding wheel into said semiconductor device so as to cut a circular oblique groove into said at least approximately planar surface of said semiconductor device while said planar forward surface faces said first axis extending from the center of said at least approximately planar surface of said semiconductor device,

whereby a circular oblique groove which is sloped toward the center of said semiconductor device is ground in said at least approximately planar surface of said semiconductor device.

4,517,770
GEMSTONE POLISHING MACHINE

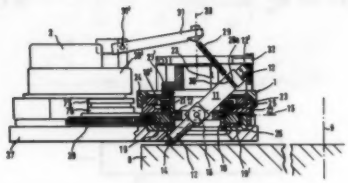
Alec Leibowitz, 16c, Mutual Pl., Beach Rd., Seapoint, Cape Town, South Africa

Continuation of Ser. No. 353,912, Mar. 2, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,285

Claims priority, application South Africa, Aug. 10, 1981, 81/8466; United Kingdom, Aug. 11, 1981, 8124446

Int. Cl.³ B24B *9/16*

U.S. Cl. 51—125.5 **18 Claims**



1. A gemstone polishing machine for working facets on a gemstone or the like, each facet having a grain orientation, using a moving working member which contacts the stone in a working plane, the machine comprising:

a mount for supporting the stone;

pivot means carrying the mount and restraining the mount to pivotal motion about two axes, namely a first axis which will lie in a plane substantially parallel to but spaced from the working plane, and a second axis which is at an angle to the first axis, the first and second axes substantially intersecting at a point at which they also substantially intersect a third, mount axis which is at an angle to the first and second axes and which will be substantially coincident with the axis of the stone and inclined to the working plane;

means for altering the position of the first axis in said plane parallel to the working plane by rotating the first axis about a fourth, normal axis normal to the working plane, and for locating the first axis in position; and

means for altering the position of the mount axis by rotating the mount axis substantially about the normal axis, and for locating the mount axis in position;

whereby the grain orientation can be changed by rotating the mount axis and the first axis through the same angle about the normal axis, and the facet being worked can be changed by causing relative rotation about the normal axis between the mount axis and the first axis, the pivot means causing the mount to rotate about the mount axis due to the interaction of the restraints of the first and second axis pivotal motions.

4,517,771
ELONGATED ANNULAR VIBRATORY BARREL FINISHING APPARATUS HAVING UNBALANCED WEIGHTS CONTROLLED BY AN ELECTRONIC PROCESSOR

Hisamine Kobayashi; Tomihiro Ishiguro, and Akio Murata, all of Nagoya, Japan, assignors to Shikishima Tipton Manufacturing Co., Ltd., Nagoya, Japan

Filed Dec. 6, 1982, Ser. No. 447,007

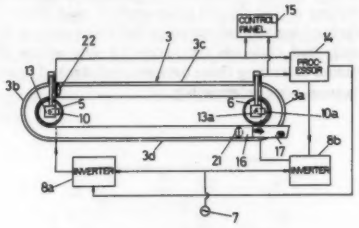
Claims priority, application Japan, Dec. 10, 1981, 56-199034; Apr. 5, 1982, 57-56327

Int. Cl.³ B24B *31/00*

U.S. Cl. 51—163.2 **10 Claims**

1. An endless elongated annular vibratory barrel finishing apparatus for line processing of workpieces to be finished, said vibratory finishing apparatus comprising:

an endless elongated vibratory barrel having two opposed semicircular barrel outer and inner wall segments and straight barrel outer and inner wall segments extending therebetween to form the elongated barrel, said barrel having a cross-section traverse to the length thereof which is symmetrical about the center of the cross-section and having two U-shaped portions between the inner and outer walls, a plurality of springs supporting the bottom of said vibratory barrel and extending along the bottom of the barrel in a line generally parallel to the axis of the



U-shaped cross-sectional portions, a plurality of vibrating motors, disposed symmetrically on the longitudinal axis, each having unbalancing weights at both ends of their shafts, and a controlling means for electrically adjusting a rotational speed of the motors and the phase of rotation between said vibrating motors.

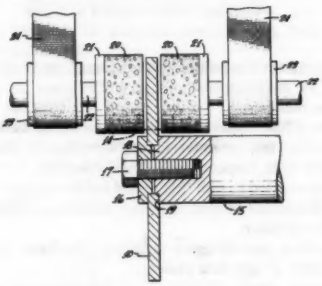
4,517,772
RIGID COMPUTER MEMORY DISC MANUFACTURING METHOD

Richard J. Elliott, Costa Mesa, Calif., assignor to Charlton Associates, Irvine, Calif.

Filed Dec. 12, 1983, Ser. No. 560,416

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—281 SF **4 Claims**



1. A method of manufacturing a rigid computer memory disc where operations may be simultaneously performed on both faces of said disc comprising:

providing a disc with an outer diameter and a false inner diameter which is smaller than a desired inner diameter thereof;

clamping said disc to a spindle using only the area between said false inner diameter and said desired inner diameter thereby leaving the entire area between the outer diameter and the desired inner diameter exposed;

simultaneously performing manufacturing operations on both opposed surfaces of said disc while clamped to said spindle; and

subsequently removing said area between said false and desired inner diameters by cutting said disc along said desired inner diameter.

4,517,773

DRIVABLE WHEEL FOR THE FINISH GRINDING OR POLISHING OF THE SURFACE OF A VEHICLE BODY OR THE LIKE

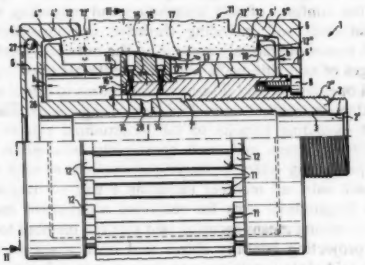
Ulrich Heiden, Munich, and Peter Atzler, Altomunster, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,683

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145151

Int. Cl.³ B24B 9/02

U.S. Cl. 51—336 16 Claims



1. A drivable wheel for finish grinding or polishing the surface of a vehicle body or the like, comprising a mounting shaft with a plurality of spaced-apart flanges, one of said plurality of flanges being displaceable in an axial direction relative to another of said plurality of flanges, supporting sleeve means having a peripherally disposed plurality of axially parallel mounting slots for mounting a plurality of radially projecting grinding elements coaxially encompassing the mounting shaft and extending between the plurality of flanges, a plurality of radially projecting grinding elements positioned relative to said mounting shaft by said plurality of flanges, and at least one ejector means operatively connected to said one of said plurality of flanges for displacing the plurality of grinding elements radially outwardly when said one of said plurality of flanges is displaced axially away from said another of said plurality of flanges.

4,517,774

WET BLASTING APPARATUS

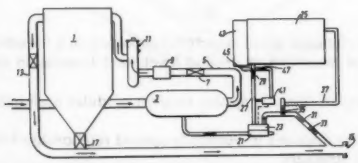
Frank Dudding, 18, Lorraine St., Hull, England HU8 8EG

Filed Aug. 9, 1982, Ser. No. 406,425

Claims priority, application United Kingdom, May 4, 1982, 8212760

Int. Cl.³ B24C 7/00

U.S. Cl. 51—436 24 Claims



1. Apparatus for abrasive blasting a surface, the apparatus comprising:

(a) means for forming a first stream of compressed air;

(b) means for forming a second stream of compressed air;

(c) means for supplying to the second stream of compressed air abrasive particles to entrain the abrasive particles in the second stream of compressed air;

(d) first pump means;

(e) means for supplying liquid to the first pump means;

(f) means for supplying the first stream of compressed air to the first pump means;

(g) second pump means;

(h) means for supplying an additive to the second pump means for pumping the additive to the liquid;

(i) means for supplying air from the first stream of compressed air supplied to the first pump means, to the second pump means to operate the second pump means; and

(j) means for supplying the first stream of compressed air entrained with liquid and additive, from the first pump means to the second stream of compressed air containing the entrained abrasive particles so as to permit compressed air, abrasive, liquid and additive to be directed through a blast nozzle.

4,517,775

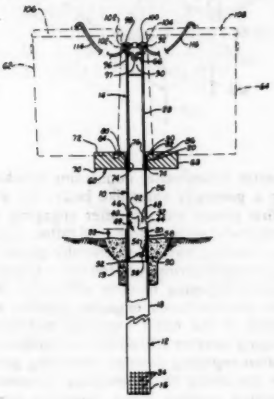
TELESCOPING SUPPORT APPARATUS FOR CONTAINERS

Thomas H. Engel, 3040 SW. 129th, Oklahoma City, Okla. 73170

Filed Jun. 10, 1983, Ser. No. 503,324

Int. Cl.³ E04H 12/00

U.S. Cl. 52—40 29 Claims



1. A telescoping support device for supporting at least one refuse container, comprising:

a ground cylinder disposable in the ground and having an upper end portion extendible a selected distance above the surface of the ground;

a support cylinder supported by the ground cylinder and slidably movable between a retracted position within the ground cylinder and an extended position substantially above the surface of the ground, the support cylinder having an upper portion and a lower portion, the upper portion having an outside diameter less than the outside diameter of the lower portion so that a support shoulder is formed at the junction of the upper and lower portions, the lower portion having a first detent slot formed therein;

first stop means supported within the lower portion of the support cylinder for selectively locking the support cylinder in the extended position, the first stop means pivotally supported in the lower portion of the support cylinder so that an end portion of the first stop means is selectively extendible through the first detent slot of the lower portion of the support cylinder and prevents movement of the support cylinder to its retracted position when the first stop means is extended through the first detent slot, the first stop means selectively removable from the first detent slot to permit the support cylinder to be retracted into the ground cylinder;

support means slidably disposed about the support cylinder

for supporting the container thereon, the support means adapted to engage the support shoulder of the support cylinder when the support cylinder is in the extended position and to engage the upper end portion of the ground cylinder when the support cylinder is in the retracted position; and

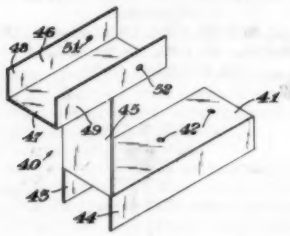
handle means secured to the upper portion of the support cylinder for selectively moving the support cylinder between the extended position and the retracted position.

4,517,776

ROOF INSULATION RETENTION

Michael Barker, Zurich, Switzerland, assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 10, 1983, Ser. No. 473,903
Int. Cl.³ E04B 7/02
U.S. Cl. 52—90 **16 Claims**



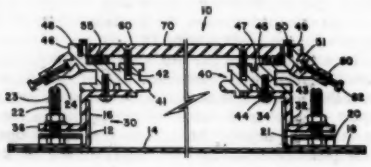
1. A counter batten-rafter connecting bracket, the bracket comprising a generally sheet-like body, the sheet-like body having a first planar arm or rafter engaging member to be nailed or otherwise secured to a roof rafter, a generally planar connecting member, having a generally planar configuration extending generally normally to the rafter engaging member, a counter batten engaging member affixed to the connecting member, the counter batten engaging member extending generally parallel to the rafter engaging member; the counter batten engaging member affixed to the connecting member, the counter batten engaging member extending generally normal to a plane containing the connecting member, the counter batten fastening member being generally remote from the rafter engaging member, the counter batten fastening member lying in a plane generally normal to the connecting member, the rafter engaging member and counter batten engaging member each has at least one flange disposed in a plane normal to the planes of the rafter engaging member, counter batten engaging member and connecting member.

4,517,777

TRENCHDUCT SIDE MEMBER EXTRUSION ADAPTED FOR MULTIPLE POSITIONING OF COVER PLATE

L. Owen Calhoun, Burlington, Canada, assignor to W. C. Pursley Limited, Mississauga, Canada

Filed Mar. 7, 1983, Ser. No. 473,101
Int. Cl.³ E04F 17/00
U.S. Cl. 52—126.2 **8 Claims**



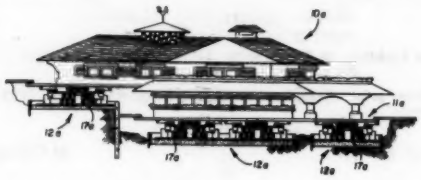
1. In a trenchduct assembly, for internally receiving electric wires and cables, the combination comprising means forming galvanized steel side walls each with an outwardly extending flange and spaced apart to define an open space for receiving electrical service therebetween, vertically adjustable galvanized steel lid-supporting means slideably engagable with said side walls whereby said lid-supporting means are operatively defined in a lateral position relative to said side walls, said lid-supporting means including steel portions forming a Z-shaped cross section, one of said steel portions comprising a vertical section complementarily associated with a respective side wall, one portion projecting laterally above the confines of the open space formed by said side walls to receive the wire cables, and one portion comprising a traverse flange disposed outside the confines of said trenchduct and extending away from said duct and including threaded openings therein, threaded means operatively secured to the outwardly extending flanges of said side walls and threadedly received by the threaded openings in said lid-supporting means to effect vertical adjustable movement of said lid-supporting means, side rail members extending parallel to the longitudinal axis of said lid-supporting means and each operatively secured to said portion projecting laterally above the confines of said open space, each side rail member including a pair of diagonally opposed longitudinal slots for receiving securement means, one slot receiving means securing said side rail member to said portion projecting laterally above said open space and the other of said slots receiving securement means for holding down a trenchduct cover plate, an upper longitudinal slot opening exterior of said trenchduct for receiving trim means therein, and a longitudinal exterior extension receiving attachment means for securing and holding together side rail members linearly aligned in end-to-end abutting relationship, and a plurality of cover plates disposed on the open end of said trenchduct at substantially floor level and secured to said side rail members.

4,517,778

EARTHQUAKE-PROOF BUILDING WITH IMPROVED FOUNDATION

Charles M. Nicolai, 401B Pine St., Mill Valley, Calif. 94941

Continuation-in-part of Ser. No. 311,671, Oct. 15, 1981, abandoned. This application Oct. 29, 1982, Ser. No. 437,681
Int. Cl.³ E04H 9/02
U.S. Cl. 52—167 **18 Claims**



1. An earthquake-proof structure supported on a foundation adapted for mounting at ground level, said foundation comprising

a plurality of laterally spaced support modules each including

a holder disposed in vertically spaced relationship below said structure

roller means mounted vertically between said structure and said holder for supporting said structure thereon and for isolating and permitting horizontal and parallel movement of said holder relative to said structure when ground surrounding said foundation is subjected to seismic activity,

a first support plate mounted in vertically spaced relationship below said holder,

first spring means mounted vertically between said holder

and said first support plate for resiliently supporting said holder and for permitting said structure and holder to tilt relative to said first support plate, and

second spring means mounted below said first support plate for resiliently supporting said first support plate and for permitting said first support plate to tilt relative to ground level.

4,517,779

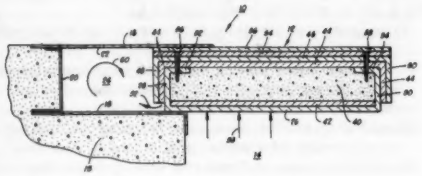
FIRE RESISTANT EXPANSION JOINT COVER

Charles L. Dunsworth, Midwest City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.

Filed Feb. 9, 1983, Ser. No. 465,195

Int. Cl.³ E04C *2/00*

U.S. Cl. 52—232 **24 Claims**



21. Fire-resistant expansion joint apparatus for connection between first and second movable structures, comprising:

enclosure means defining a volume having a relatively small open portion;

saturatued hygroscopic material contained within said enclosure means;

insulation means of permeable material secured to seal the enclosure means open portion; and

at least one base means disposed in connection to one of said movable structures to receive the enclosure means in close sliding engagement.

4,517,780

INSULATED WALL UNIT CONSTRUCTION

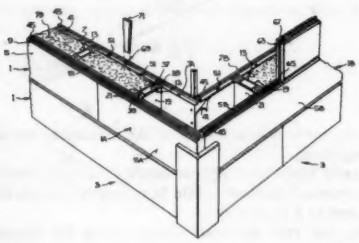
Gérard A. Lacombe, 199 O'Brien, Gatineau, Quebec, Canada J8P 2Y5, and Léopold Bonicalzi, 200 Cité des Jeunes, Hull, Quebec, Canada (J8Y 6M1)

Filed Mar. 8, 1983, Ser. No. 473,252

Claims priority, application Canada, Feb. 7, 1983, 421009

Int. Cl.³ E04B *1/10*

U.S. Cl. 52—233 **7 Claims**



1. A structural log-like member for use in constructing walls, said member comprising:

a relatively thin, wooden outer wall member having parallel top and bottom edges;

a relatively thin, wooden inner wall member having parallel top and bottom edges;

said outer and inner wall members being spaced from each other and parallel to each other, the top edge of each wall member having means projecting upwardly therefrom, and the bottom edge of each wall member having a groove or recess extending inwardly, at least one end of each wall member having a vertical slot therein which tapers from a deep end at the top of the wall member to a shallow end at the bottom of the wall member;

wooden spacer members located between the outer and inner wall members and spaced apart longitudinally of said wall members, each of said spacer members being substantially equal in height to the wall members and comprising two wooden spaced-apart end posts, said end posts being parallel to each other, and two side panels extending between the sides of the end posts to connect the end posts together;

means for joining the spacer members to the outer and inner wall members, said means comprising four nailing plates, each nailing plate extending across one end of one of the posts and a portion of one of the edges of one of the wall members; and

an insulation material located between the inner and outer wall members and between the posts and the side panels of each spacer member.

4,517,781

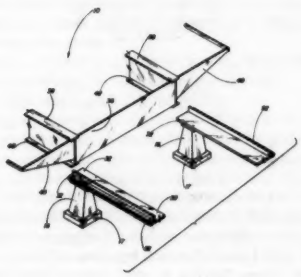
APPARATUS AND PROCESS FOR PLACEMENT OF PREFABRICATED STRUCTURES

J. T. LeBlanc, P.O. Box 17501, Baton Rouge, La. 70893

Filed Apr. 1, 1983, Ser. No. 481,343

Int. Cl.³ E02D *27/42*; E04G *21/00*

U.S. Cl. 52—299 **7 Claims**



1. A process for placement of a prefabricated building having a structural base, which comprises the following steps:

a. providing and securing foundation means to the ground;

b. extending and securing continuous track members as a double runaway longitudinally disposed between said foundation means;

c. providing guide means upon said tracking means for disallowing off-track movement of said building along said tracking means as said building is slid thereupon;

d. partially aligning said structural base on one end of said tracking members; and

e. sliding said building along said tracking means from said partially aligned position to a fully aligned position wherein the structural base of said building is resting fully on said tracking members.

4,517,782

CONSTRUCTION ELEMENT

Khosrow Shamszadeh, Bethayres, Pa., assignor to Nadalaan S.A., Geneva, Switzerland

Filed Dec. 14, 1981, Ser. No. 330,517

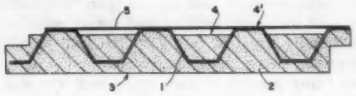
Claims priority, application Switzerland, Dec. 12, 1980, 9178/80

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.7 **6 Claims**

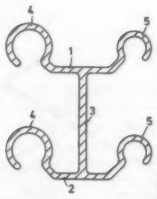
1. A flat modular construction element comprising a rigid

core formed of a ribbed sheet at least partially embedded in an insulating material which is a cellular synthetic resin foam, each face of said element being at least partly formed by said insulating material, and connecting elements extending on at



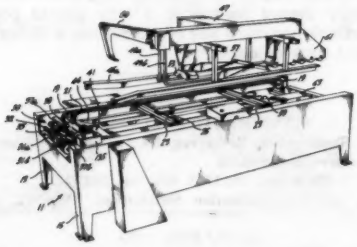
least one face of the ribbed sheet and being secured to the tops of the ribs, said connecting elements being spaced from the insulating material so as to be usable for fixing the construction element to a building structure or for securing finishing elements to said construction element.

4,517,783
ROOF OR WALL STRUCTURE
Sven Harder, Albertslund, Denmark, assignor to Aktieselskabet Jens Villadsens Fabriker, Herlev, Denmark
Filed May 21, 1982, Ser. No. 380,873
Claims priority, application Denmark, May 26, 1981, 2303/81
Int. Cl.³ E04B *5/52*
U.S. Cl. 52—481 **6 Claims**



1. A roof or wall structure, comprising a plurality of elongated plates each having lateral edge portions in the form of partially open cylindrical resilient flanges, and a plurality of elongated rigid beams disposed between adjacent ones of said plates, said beams having at each lateral edge thereof two spaced apart partially open cylindrical flanges, said flanges of said plates being snap-locked together with said flanges of said beams.

4,517,784
PROGRAMMABLE CASE SEALING MACHINE
Joel M. Beckett, Eatonville, Wash., assignor to Marq Packaging Systems, Inc., Yakima, Wash.
Filed Jun. 15, 1982, Ser. No. 388,655
Int. Cl.³ B65B *57/02*
U.S. Cl. 53—75 **24 Claims**



1. A programmable case sealing machine comprising:

(A) conveyor means for moving cases to be sealed along a path of travel;

(B) case sealing means located along said path of travel for selectively sealing the top and bottom of cases moved by said conveyor means;

(C) gate means located at the infeed end of said conveyor means for controlling the receipt of cases by said conveyor means;

(D) conveyor sensing means for sensing the position of said conveyor means and, thus, the position of cases moved by said conveyor means;

(E) case infeed sensing means for sensing the presence of a case on the infeed side of said gate means;

(F) programming means for producing programming information for controlling the operation of said case sealing means; and,

(G) a central processing unit coupled to:

(1) said conveyor means for receiving said information about the position of said conveyor means;

(2) said case infeed sensing means for receiving information about the presence of a case at the infeed end of said gate means;

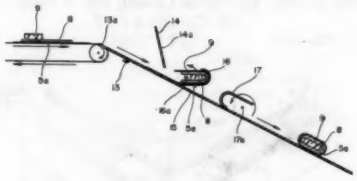
(3) said programming means for receiving and storing said programming information; and,

(4) said gate means and said case sealing means for:

(a) actuating said gate means to allow a case to be received by said conveyor means when said conveyor means is in a predetermined position; and,

(b) controlling said case sealing means so that the top and bottom of cases moved by said conveyor means passed said case sealing means are selectively sealed in accordance with the programming information received by said center processing unit from said programming means.

4,517,785
AUTOMATIC CONFECTIONARY-AND-LIKES MANUFACTURING EQUIPMENT
Fumihiko Masuda, Tokorozawa, Japan, assignor to Shin Nihon Machine Manufacturing Co., Ltd., Saitama-ken, Japan
Filed Feb. 8, 1982, Ser. No. 346,709
Int. Cl.³ B65B *11/10, 63/04*
U.S. Cl. 53—116 **2 Claims**



1. An automatic confectionary or like manufacturing equipment comprising;

a generally horizontal, porous moving track for feeding a heat-resistant continuous film horizontally thereon from a first end to a second end;

at least one raw material laying device for depositing confectionary raw material on said continuous film, and overlaying said moving track;

at least one contents laying device for supplying contents on deposited raw material, said contents laying device overlying said moving track and disposed contiguous to said raw material laying device, downstream in said film moving direction;

a film cutting device for cutting said continuous film after deposition of said raw material and said contents on said film, said film cutting device being disposed contiguous to said contents laying device, and being in juxtaposition to

said moving porous track, downstream in said film moving direction from said contents laying device;

a position holding device for holding said continuous film and said cut film in proper position while moving on said porous moving track, said position holding device comprising a wind box underlying said porous moving track for applying suction pressure through said porous moving track against said continuous film and said cut film;

a wrapping device in juxtaposition to said porous moving track and downstream therefrom for surrounding said contents with raw material and simultaneously wrapping said raw material with said cut film, said wrapping device being disposed contiguous to said film cutting device, and downstream in the film moving direction therefrom;

said wrapping device comprising an oscillating plate pivoted at an upstream end for pivoting about a horizontal axis in the plane of said porous moving track and at the downstream end of said track between a first horizontal position in line with said porous moving track and a second position inclined downwardly from the horizontal at an inclined angle thereto;

a downwardly inclined stationary plate positioning contiguous to said oscillating plate and acting an extension thereof when said oscillating plate is pivoted from the horizontal position to a downwardly inclined position;

a rotary plate pivoted at its center, overlying said downwardly inclined plate and pivotable from a first position in line with said oscillating plate and being horizontal as an extension of said oscillating plate and said porous moving track to a position at right angles to said downwardly inclined stationary plate to partially wrap said contents;

and at least one forming plate of U-shaped configuration, means for rotatably mounting said at least one forming plate about a horizontal axis, positioned above said downwardly inclined plate and having a straight portion extending from an arcutate portion terminating in an edge contactable with the top of said downwardly inclined plate so as to receive under gravity movement said cut film and said raw material partially wrapped about said contents and for facilitating further wrapping thereof prior to gravity discharge from said U-shaped forming plate as said forming plate rotates about said horizontal pivot axis.

4,517,786

METHOD OF AND APPARATUS FOR WRAPPING ARTICLES

Jeffrey G. Barker, High Wycombe, England, assignor to Ranks Hovis McDougall p.l.c., England

Filed Oct. 6, 1982, Ser. No. 433,089

Claims priority, application United Kingdom, Oct. 8, 1981, 8130389

Int. Cl.³ B65B *9/10, 7/12, 51/00*

U.S. Cl. 53—450 **11 Claims**

1. A method of wrapping fragile or easily collapsible articles in foil, which includes continuously passing articles in spaced succession along a track, laying foil continuously over the articles to pass along the tracks therewith, continuously passing the articles and foil beneath a folding plate which forms the foil into a tube surrounding the articles, continuously feeding the articles and tube to a twisting and severing stations, arresting the forward motion of that article and its portion of surrounding tube which has entered the twisting and severing station, rotating said arrested article and its surrounding tube portion about the main axis of the tube to form a twist in the tube between that article and the succeeding article, the continuous feed of the other of said articles downstream of said arrested article causing the gap between said arrested article and said succeeding article to diminish during said rotating step, and thereafter severing said twist with a knife; and repeating said twisting and severing of the tube between successive articles.

4,517,787

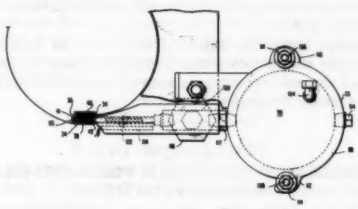
METHOD AND APPARATUS FOR SEALING BAGS

William D. Kreager, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 17, 1982, Ser. No. 408,918

Int. Cl.³ B65B *51/26, 9/10, 9/12*

U.S. Cl. 53—450 **15 Claims**



13. The method of applying adhesive to overlapping edges of package-forming sheet material to provide a seal therebetween comprising the steps of:

(a) providing an adhesive applicator having spaced adhesive dispensing openings on opposite sides thereof;

(b) moving said edges past the applicator;

(c) supplying adhesive to said applicator and to said openings for applying spaced lines of adhesive to said overlapping edges as they are moved past the applicator; and

(d) moving said overlapping edges together with the lines of adhesive on one overlapping edge engaging the spaces between lines of adhesive on the other overlapping edge to provide a continuous adhesive coating.

4,517,788

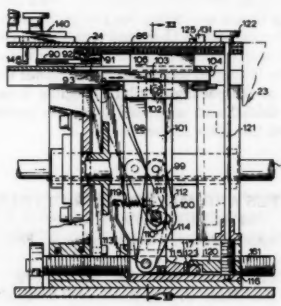
MECHANISM FOR FILLING BAGS OF DIFFERENT SIZES

Richard W. Scheffers, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Sep. 30, 1982, Ser. No. 429,507

Int. Cl.³ B65B *41/18, 57/02, 43/26*

U.S. Cl. 53—459 **13 Claims**



1. An automatic packaging apparatus for vertically filling plastic bags laterally interconnected with one another in a

chain wherein each bag has closed bottom and side edges and a reclosable upper end mouth having interlocking fastener strip profiles running laterally across opposed inner facing surfaces of said mouth and wherein each bag is initially received in said apparatus with the fastener strip profiles interlocked, comprising:

a first work station for unlocking the fastener strip profile and opening the mouth of each bag for filling,

means for filling each bag,

a second work station for relocking the fastener strip profiles of each bag after filling and for separating each filled and relocked bag from the remainder of said chain,

a drive means for laterally conducting said chain through said first and second work station, said drive means alternately imparting forward and reverse stroke movements to said chain for conveying each bag of said chain from one work station to the other and separating each filled and relocked bag from the remainder of said chain, respectively, and

a control means for adjusting the length of forward and reverse stroke movement imparted by said drive means such that said apparatus is adapted to handle bags of various lateral dimensions.

4,517,789

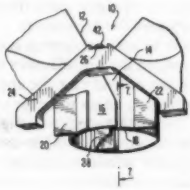
SEPARATOR-FOLDER FOR FORM-AND-FILL PACKAGING MACHINES

Robin T. Ash, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 3, 1983, Ser. No. 519,848

Int. Cl.³ B65B *9/10*

U.S. Cl. 53—545 **6 Claims**



1. A separator-folder device for use in forming a web to produce a fin seal on a form-and-fill machine, the form-and-fill machine having a former for forming a flat web of packaging film into tubular shape with overlapping edges, the former including a cross-over head with separated and overlapping inner and outer lips, the separator-folder device comprising; an elongated member having at least a portion thereof U-shaped in section, means forming a low friction surface on at least a portion of the elongated member in contact with the packaging film, mounting means mounting the elongated member to the former with the legs of the U-shaped sectional portion extending parallel to and spaced from the former lips, and with the open end of the U-shaped section facing the inner former lip so that the edge of the packaging film extending from the inner former lip is folded and separated from the packaging film extending from the outer former lip.

4,517,790

APPARATUS AND METHOD FOR ULTRASONIC SEALING OF PACKAGES

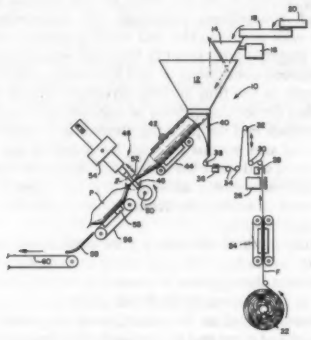
William D. Kreager, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Feb. 27, 1984, Ser. No. 583,970

Int. Cl.³ B29C *27/08;* B31B *21/14, 21/60*

U.S. Cl. 53—552 **15 Claims**

1. Apparatus for making an ultrasonic end seal on a package produced in connection with the form and fill machine, the apparatus comprising: a movable ultrasonic horn, mounting means with an adjustable arcuate movement for moving an adjustable said horn into juxtaposition with one side of the package, a movable ultrasonic anvil mounted for rotary movement, means for moving the anvil into juxtaposition with the other side of the package, means for synchronizing the movement of the ultrasonic horn and anvil so that they are simultaneously positioned on opposite sides of the package to accomplish ultrasonic sealing while the package is moving, means for supplying power to the ultrasonic horn when the horn and the anvil are on opposite sides of the package with the package therebetween, and said mounting means for the ultrasonic horn comprises a crank eccentric mounting means for driving the horn through a movable and adjustable pivot point so that by change of position of the pivot point the residence time in the area of the seal may be increased or decreased.



4,517,791

APPARATUS FOR GROUPING CIGARETTE CARTONS AND LOADING CONTAINERS THEREWITH

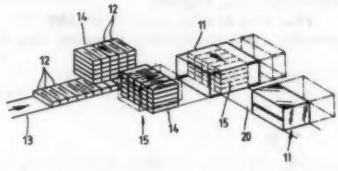
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Mar. 2, 1982, Ser. No. 354,005

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110720

Int. Cl.³ B65B *5/06, 19/12*

U.S. Cl. 53—566 **6 Claims**



1. An apparatus for inserting elongate cuboid packages, such as cigarette cartons, into an open-ended container, comprising:

(a) a grouping station (23),

(b) an elongate supply conveyor (13) for transporting successive elongated cartons positioned perpendicularly thereto (12) to the grouping station,

(c) means (24) at the grouping station for stacking successive layers of cartons into multi-pack groups,

(d) a rotatable turntable (27) disposed adjacent the grouping station and laterally offset from the supply conveyor,

(e) first pusher means (26) for laterally pushing individual carton groups out of the grouping station and onto the turntable,

(f) means (20) disposed adjacent the turntable for supporting a container (10 or 11) with the plane of an open end (16)

thereof facing the turntable and perpendicular to said supply conveyor, an insertion axis of the container being parallel to but laterally offset from the supply conveyor,

(g) second pusher means (29) for pushing individual carton groups off of the turntable and into a container in a direction parallel to but laterally offset from the supply conveyor,

(h) means for selectively rotating the turntable through 90° after the delivery of a carton group thereto and before the expulsion thereof by the second pusher means, whereby carton groups may be inserted into a container with the longitudinal axes of individual cartons in a group either parallel to the open end of a container without turning said turntable or perpendicular thereto with turning said turntable in dependence upon the relative dimensions of a carton group and a container,

(i) a pair of spaced, parallel, vertical retaining walls (32, 33) mounted on the turntable and rotatable together therewith, said walls being mounted perpendicular to said supply conveyor during transfer of said carton groups onto said turntable for laterally supporting carton groups on the turntable, and

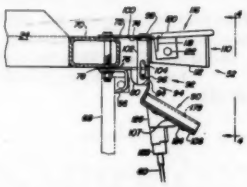
(j) means for selectively lowering a one of the retaining walls closest said open container end into a position underneath the turntable when said turntable is not rotated such that an upper edge of said one wall extends no higher than a support face of the turntable.

4,517,792

GRAIN LOSS MONITOR SENSOR MOUNTING ARRANGEMENT FOR A COMBINE

Barry K. Denning, Woodhull, and Duane H. Ziegler, Colona, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed May 7, 1982, Ser. No. 375,894
Int. Cl.³ A01F *12/44, 7/06*
U.S. Cl. 56—10.2 **7 Claims**



1. In a combine harvester having a plurality of elongated reciprocating straw walkers each walker having a discharge end, a cleaning shoe including at least one reciprocating generally horizontal foraminous member having a rear discharge edge, and a grain loss monitor system including at least one first sensor carried by a straw walker adjacent its discharge end and at least one second sensor carried by the reciprocating member adjacent its discharge edge, each sensor having a sensing surface and a mounting face approximately parallel to the sensing surface, and in which threshed crop material is received by the straw walkers and conveyed rearwardly so that a first portion of material passes over their discharge ends while some grain and other small fractions of the crop material pass downwards to the cleaning shoe which processes that portion of the material so that a second portion passes over the discharge edge of the reciprocating member and at least some of the first and second portions of crop material makes an impact on the sensing surfaces of the first and second sensors respectively, the grain loss monitor system being operable to discriminate between the impacts on the sensors of kernels of grain and other materials so as to indicate a rate of loss of grain according to the amount of grain contained in the first and second portions respectively, an improved mounting arrangement for the sensors comprising:

a socket means carried by the reciprocating member adjacent its discharge edge;

bracket means carried by the reciprocating member adjacent its discharge edge, spaced generally vertically from the socket means, and carrying a first latching element; and

a sensor mounting bracket having a generally upright wall, a sensor mounting surface for receiving the sensor mounting face extending rearwardly and downwardly from the base of the upright wall, and a tang extending forward from the upright wall, and carrying a second latching element for mating with the first latching element, spaced vertically from the tang so that the sensor mounting bracket may be attached to the reciprocating member by engaging the tang in the socket means and positioning the sensor mounting bracket so that the second latching element engages the first latching element to position the bracket and so that the sensor is disposed with its sensing surface directed rearwardly and upwardly, the upright wall also carrying a rearwardly extending support arm and a deflector plate spaced vertically upwards from the sensor and having opposite portions extending cantilever fashion in opposite directions from the support arm and approximately spanning the lateral extent of the sensor sensing surface.

4,517,793

RADIO OPAQUE FIBRE

Edmund H. Carus, Darwen, and Eric F. T. White, Alderley Edge, both of England, assignors to Vernon-Carus Limited, Darwen, England

Filed Aug. 23, 1983, Ser. No. 525,768
Int. Cl.³ D02G *3/02, 3/00*
U.S. Cl. 57—243 **14 Claims**

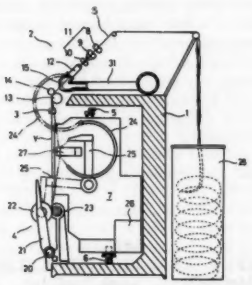
1. A radio-opaque polypropylene fibre comprising, a coupling agent and 55% to 70% by weight of barium sulphate.

4,517,794

METHOD OF GUIDING YARN END IN AIR SPINNING APPARATUS

Shoji Sakai, Kyoto; Michiaki Fujiwara, Shinomachi; Nobunori Kubota, and Koshi Noda, both of Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 28, 1981, Ser. No. 335,222
Claims priority, application Japan, Oct. 22, 1981, 56-169527
Int. Cl.³ D01H *11/00;* **D02G** *1/16*
U.S. Cl. 57—304 **14 Claims**



1. In a spinning apparatus using an air jet nozzle having a nozzle orifice from which spun yarn exits said jet nozzle, a device for uniformly retrieving a loose yarn end located at said nozzle orifice comprising:

suction means disposed remotely from said nozzle orifice for removing debris;

connection means for connecting said suction means solely to said nozzle orifice, such that said suction means will remove dust from said nozzle orifice by a continuous suction air flow through said suction means; and

retrieval means, relocatably positionable between a position

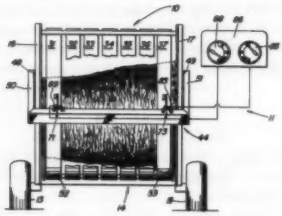
remote from said nozzle orifice and a position within said connection means adjacent said nozzle orifice, for retrieving and retaining said loose yarn end at said nozzle orifice in the presence of said continuous suction air flow, such that said retrieval means will uniformly dominate the tendency of said loose yarn end to be drawn into said suction means.

4,517,795

BALE-SHAPE GAUGE FOR BALER FOR FORMING CYLINDRICAL BALES

Gerald F. Meiers, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 28, 1979, Ser. No. 98,280
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **7 Claims**



1. In a machine for forming cylindrical bales of crop material, said machine comprising:

a mobile frame;

a plurality of loop means respectively supported on said frame for movement in a plurality of laterally spaced parallel planes;

a bale-forming chamber having a bale-winding axis extending substantially perpendicular to said planes, said chamber defined by said frame and by a span of each of said loop means; and

a tensioning and take-up mechanism for lengthening the span of each loop means defining said chamber and thereby increasing the size of said chamber transverse to the bale-winding axis responsive to the increasing diameter of the largest diameter portion of a bale being wound in said chamber wherein the improvement comprises:

a gauge including sensing means for sensing the relative diameters of a bale being formed in said chamber at two axially-spaced points on the bale periphery and continuously generating first and second signals corresponding to the relative diameters, visual indicating means responsive to said first and second signals for continuously indicating the relative diameters of said bale at said spaced points; and transmitting means coupled between said sensing means and said visual indicating means for transmitting said first and second signals to said visual indicating means.

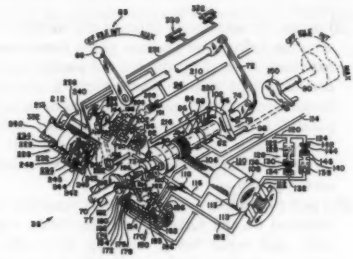
4,517,796

POWER LEVER APPARATUS FOR A TURBINE ENGINE

Howard L. McCombs, Jr., South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jun. 3, 1983, Ser. No. 500,728
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.281 **42 Claims**

20. In a turbine engine having a compressor with a bleed valve device and a variable geometry apparatus responsive to an operational control member for regulating the flow rate of fuel supplied through a conduit to said turbine engine as a function of atmospheric pressure and the temperature of air supplied to the compressor in response to movement of a power lever by an operator to a position corresponding to a desired operation of the turbine engine, the power lever comprising: an input member that moves in direct response to an input by the operator and a follower member linked to the operational control member, said follower member being connected to the input member by a fluidic connection responsive to an operating signal representing the operating parameters of



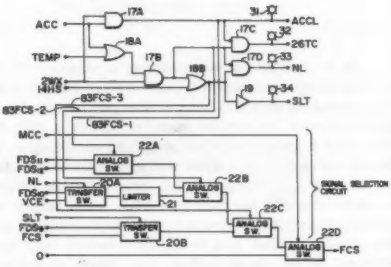
the turbine engine to limit the rate of fuel flow during acceleration and deceleration to substantially prevent stalling and the development of unacceptable operating temperatures: and means connected to said fluidic connection for overriding said operating signal to allow unrestricted input to said control member.

4,517,797

FUEL CONTROL METHOD FOR GAS TURBINE

Shigeki Adachi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,774
Claims priority, application Japan, May 25, 1981, 56-78136; Sep. 14, 1981, 56-143760; Dec. 4, 1981, 56-194544
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.281 **4 Claims**



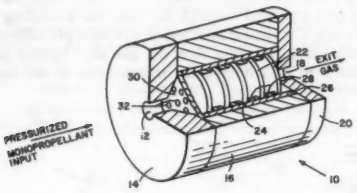
1. A fuel control method for a gas turbine wherein a plurality of control systems for fuel flow rate control are graded in accordance with a predetermined preference order, a fuel flow rate control signal of a particular control system of the highest grade in the predetermined preference order is selected when an actually measured value in the form of a feedback signal exceeds a target value in the plurality of control systems, and the fuel flow rate is controlled by the selected signal, the plurality of control systems comprising start-up, speed, acceleration and exhaust gas temperature control systems, the acceleration control system and the exhaust gas temperature control system being both of the first grade of the preference order and controlled preferentially to the other control systems.

4,517,798

POROUS CATALYTIC METAL PLATE DEGENERATION BED IN A GAS GENERATOR

Thomas G. Roberts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1983, Ser. No. 499,581
Int. Cl.[3] F02K *9/42, 9/95*
U.S. Cl. 60—39.462 2 Claims



1. A gas generator comprising: chamber means having an input port for receiving fluid monopropellant and an output port for providing for gaseous output; and, a plurality of porous catalytic metal plates disposed within said chamber in parallel spaced relation and normal to the axis of said input and output ports, said catalytic metal plates being formed of only a self-supporting catalyst, said catalyst being selected to cause exothermic decomposition of

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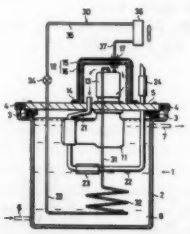
4,517,799

HEAT UTILIZING SYSTEM USING INTERNAL COMBUSTION ENGINE

Tadashi Hanaoka, and Hiroaki Umezu, both of Tokyo, Japan, assignors to Misawa Home Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,176
Claims priority, application Japan, Mar. 9, 1983, 58-39424; Mar. 9, 1983, 58-39425
Int. Cl.[3] F25B *27/00*
U.S. Cl. 62—323.1 20 Claims



1. A heat utilizing system using an internal combustion engine, said heating system comprising:

(a) a vessel containing a heat transfer medium therein and having a top, said vessel top being provided with an opening;

(b) an internal combustion engine, at least part of said internal combustion engine being immersed in said heat transfer medium and being supported by a support member provided on said vessel opening;

(c) an exhaust pipe for conducting hot exhaust gases away from said internal combustion engine, said exhaust pipe being immersed in said heat transfer medium and attached to said internal combustion engine, said heat transfer medium thus comprising a heat sink for waste heat from said internal combustion engine and for heat taken from said exhaust gases conducted away from said engine by said exhaust pipe; and

(d) a component driven by said internal combustion engine.

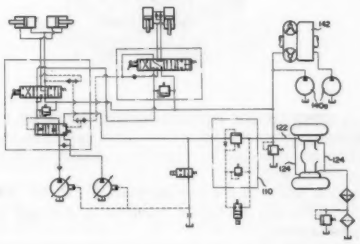
4. A heat utilizing system using an internal combustion engine as set forth in claim 1, wherein said driven component is a coolant compressor of a heat pump.

4,517,800

HYDRAULIC CONTROL SYSTEM FOR OFF-HIGHWAY SELF-PROPELLED WORK MACHINES

Tadao Karakama, Kawasaki, and Kazuo Uehara, Tokyo, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,424
Claims priority, application Japan, Oct. 31, 1980, 55-154835; Oct. 31, 1980, 55-154836
Int. Cl.[3] B62D *5/06;* F15B *11/16, 13/06;* F16D *33/00*
U.S. Cl. 60—337 11 Claims



1. A hydraulic control system for an off-highway self-propelled work machine comprising:

(a) first and second sources of hydraulic fluid under pressure;

(b) fluid actuated steering cylinder means;

(c) a steering valve for controllably actuating the steering cylinder means;

(d) fluid actuated implement cylinder means;

(e) an implement valve for controllably actuating the implement cylinder means, said implement valve being connected downstream of said steering valve and receiving pressurized fluid therethrough;

(f) a demand valve for selectively delivering the pressurized fluid from the first and second sources to the steering valve and to the implement valve in order to permit the valves to actuate the steering cylinder means and the implement cylinder means, said demand valve having a drain line for bypassing pressurized fluid not delivered to the steering valve and to the implement valve;

(g) means responsive to the operation of the steering valve for causing the demand valve to deliver the pressurized fluid from the first source to the steering valve upon displacement of the steering valve to less than a predetermined degree and for causing the demand valve to deliver the pressurized fluid from both first and second sources to the steering valve upon greater displacement of the steering valve; and

(h) means responsive to the operation of the implement valve for causing the demand valve to deliver the pressurized fluid from the first source to the implement valve when the implement valve is operated to actuate the implement cylinder means in one direction, and for causing the demand valve to deliver the pressurized fluid from both first and second sources to the implement valve when the implement valve is operated to actuate the implement cylinder means in the opposite direction.

4,517,801

SUPERCHARGING PRESSURE CONTROL DEVICE FOR TURBOCHARGED INTERNAL COMBUSTION ENGINES

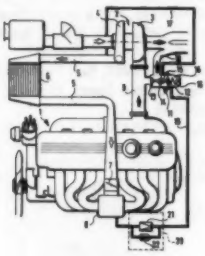
Johannes Emonts, Grossberghofen, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 463,680

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203805

Int. Cl.³ F02B 37/12

U.S. Cl. 60—602 2 Claims



1. A supercharging pressure control device for a mixture-compressing internal combustion engine having an exhaust gas turbocharger operable in response to actuation of a throttle valve, comprising:

a bypass valve and a bypass conduit for the exhaust gas turbocharger, the bypass valve being disposed in the bypass conduit,

a regulating unit for the bypass valve operably responsive in opening and closing directions to intake pressure in an intake arrangement for the engine and supercharging pressure from the exhaust gas turbocharger, respectively,

a diaphragm separating the regulating unit into two chambers and being operable as a drive element in the regulating unit,

a first chamber of said regulating unit being directly responsive to supercharged air passing through a first control conduit connected to said exhaust gas turbocharger upstream of said throttle valve and

a second chamber of said regulating unit including a closing spring and being connected to the intake arrangement downstream of the throttle valve by an actuator and a second control conduit,

the actuator including a pressure limiting valve limiting pressure in the second chamber to a predetermined reference pressure.

4,517,802

TURBOCHARGER COMBUSTOR METHOD

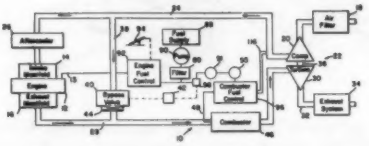
Robert J. Kobayashi, Rancho Palos Verdes; James H. Nancarrow, Torrance, both of Calif., and Jeffrey L. Alger, Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 413,640, Sep. 1, 1982, Pat. No. 4,464,901, which is a continuation of Ser. No. 142,538, Apr. 21, 1980, abandoned, which is a continuation of Ser. No. 855,048, Nov. 25, 1977, abandoned. This application Jan. 20, 1984, Ser. No. 572,283

Int. Cl.³ F02B 37/00

U.S. Cl. 60—606 15 Claims

1. In an internal combustion reciprocating engine having a turbocharger driven by exhaust gases to provide compressed charge air to the engine, a method of supplementing the energy level of the exhaust gases at selected engine operating conditions comprising the steps of mounting a combustor in an exhaust conduit between the engine and the turbocharger for in-line passage of the exhaust gases; controllably supplying fuel to the combustor in response to engine operating conditions; injecting and atomizing with fuel injector means the fuel supplied to the combustor using a portion of the gases flowing through the combustor to permit combustor operation with sustained combustion of the fuel and the gases flowing through the combustor, said injecting and atomizing step including forming a cup-shaped fuel nozzle having a base at a fuel entrance end and a relatively open exit end opening into the combustor, directing a stream of fuel supplied in said fuel supplying step along the longitudinal axis of the nozzle via a fuel metering tube received through the base and extending a short distance into the nozzle interior, directing a plurality of axially and angularly inwardly directed gas jets through jet openings formed in said nozzle for intersection at the fuel



stream slightly beyond the termination of the metering tube to turbulently break up and substantially immediately pick up and atomize the fuel stream, and directing a plurality of tangential swirl gas streams through swirl openings formed radially with respect to the point of intersection of the gas jets the combined effect of the gas jets and swirl streams creating a substantially atomized gas-fuel cloud for combustion within the combustor; controllably bypassing a surplus portion of the turbocharger charge air flow around the engine to the combustor during relatively low speed engine operating conditions; and preventing bypass air flow around the engine at relatively high speed engine operating conditions, said bypassing step including mixing of the surplus portion of bypass air flow with exhaust gases upstream of the combustor.

4,517,803

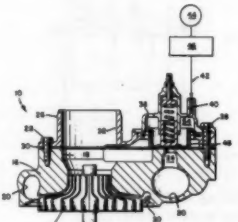
TURBOCHARGER COMPRESSOR VALVE

Terry Jamison, Hermosa Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 22, 1983, Ser. No. 487,623

Int. Cl.³ F02B 37/12

U.S. Cl. 60—611 13 Claims



13. In a turbocharger having centrifugal compressor means rotatably mounted within a compressor housing for receiving airflow through an inlet passage opening onto a planar, end face of said housing, and for discharging said airflow in a high pressure state through a discharge passage in the housing, said housing having an interconnection duct extending from said discharge passage and opening onto said end face;

an adapter housing secured to said end face of the compressor housing, said adapter housing defining an axially extending airflow inlet port aligned with and communicating with said inlet passage of the compressor housing, and

an axially extending opening aligned with said interconnection duct;

a cover housing secured to said adapter housing to close said opening therein, said cover housing having a signal port adapted to communicate an external pressure signal source to the interior of said cover housing;

a flexible diaphragm having a continuous peripheral edge sealingly clamped between said adapter and cover housings, said diaphragm disposed in overlying relationship with said interconnection duct; and

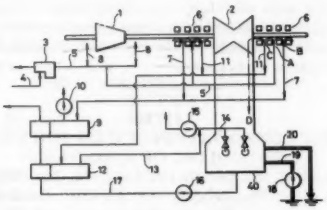
biasing means reacting between said adapter housing and said diaphragm for urging said diaphragm into a first position in sealing engagement with said end face of the compressor housing to interrupt fluid communication between said inlet and discharge passages through said interconnection duct.

4,517,804

CONDENSER VACUUM RETAINING APPARATUS FOR STEAM POWER PLANT

Katsumi Ura, Kitaibaraki; Taiji Inui, and Kenji Sakka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,802
Claims priority, application Japan, Sep. 17, 1982, 57-160853
Int. Cl.³ F01K *21/00*
U.S. Cl. 60—657 **14 Claims**



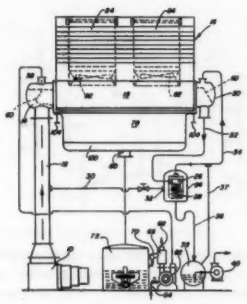
1. A vacuum retaining arrangement for a steam power plant including a turbine means, a condenser means associated with said turbine means, means for extracting air from said condenser means, a gland packing means for enabling a forming of a steam seal for the turbine means, and first gland condenser means communicating with the gland packing means at a position spaced outwardly from a steam inlet port means for supplying the sealing steam to said gland packing means so as to enable steam extracted from said gland packing means to be supplied to said first gland condenser means to prevent a leaking of the sealing steam into atmosphere, the vacuum retaining arrangement comprising means connected to the gland packing means at a position near the condenser means for receiving sealing stream from said gland packing means, means for connecting said means for receiving to said means for extracting air from said condenser means for extracting the sealing steam from said gland packing means, and second gland condenser means interposed between said means for receiving and said means for extracting air from said condenser means for enabling steam extracted from said gland packing means to be supplied into said second gland condenser means to prevent a leaking of the sealing steam into said condenser means associated with said turbine means.

4,517,805

VACUUM PRODUCING CONDENSER

Walter Kals, Hastings-on-Hudson, N.Y., assignor to Niagara Blower Company, Buffalo, N.Y.

Division of Ser. No. 491,594, May 4, 1983, which is a continuation-in-part of Ser. No. 324,785, Nov. 25, 1981, abandoned. This application May 18, 1984, Ser. No. 611,612
Int. Cl.³ F01K *19/10*
U.S. Cl. 60—688 **9 Claims**



1. In a vacuum producing condenser for vapors containing non-condensible gases, means defining a condenser chamber with condenser tubes therein, means for directing water onto the condenser tubes, means for collecting said water after it has been directed over said condenser tubes for recycling onto the condenser tubes, means for exhausting non-condensible gases from the condenser including intake means for receiving cooling water to facilitate operating said exhausting means, and means passing said cooling water from said exhausting means into said collecting means to replace water evaporated while passing over said condenser tubes.

4,517,806

APPARATUS FOR SEPARATING ICE FROM A SLURRY AND WASHING THE ICE

Raymond Korzonas, Chicago, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Apr. 9, 1984, Ser. No. 598,494
Int. Cl.³ B01D *9/04*
U.S. Cl. 62—123 **6 Claims**

1. Apparatus for separating ice from concentrated liquid and washing the ice, comprising:

a vessel having a bottom and vertical wall joined to the bottom;

a plurality of vertical tubular members positioned in the vessel and extending upwardly from the bottom, with said tubular members having perforations in the upper portion thereof through which concentrated liquid in the vessel can drain into the tubes;

a first conduit for feeding a slurry of ice and concentrated liquid to the vessel;

a second conduit communicating with the tubes for withdrawing concentrated liquid from the tubes;

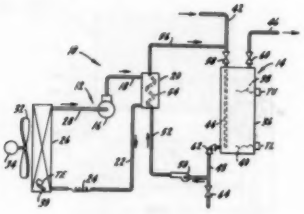
a concentrated liquid withdrawal third conduit communicating with the vessel lower interior portion for withdrawing concentrated liquid from the vessel; and

control means to maintain a predetermined concentrated liquid level, and a predetermined pressure distribution, in the vessel.

4,517,807
HEAT PUMP WATER HEATER WITH SUPPLEMENTAL HEAT SUPPLY

James R. Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 416,435, Sep. 10, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,891
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—156 20 Claims

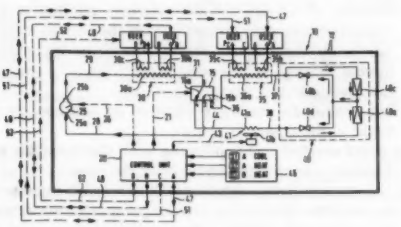


1. A heat pump water heater with supplemental heat supply comprising heat pump means for heating water, said heat pump means including an evaporator, tank means cooperatively associated with said heat pump means for storing said water, supplemental water heating means, means for sensing the temperature of water in said tank means, and means for controlling the operating cycle of said heater, said control means including means for sensing the formation of frost on said evaporator, said control means initiating said operating cycle by turning on said heat pump means in response to sensing by said tank water temperature sensing means of a water temperature below a predetermined temperature, and concluding said operating cycle in the absence of the formation of frost on said evaporator by turning off said heat pump means in response to sensing by said tank water temperature sensing means of a water temperature at a predetermined temperature, said control means continuing said operating cycle in the event said frost sensing means senses the formation of frost on said evaporator by turning off said heat pump means and turning on said supplemental heating means, maintaining said heat pump means turned off and said supplemental heating means turned on until said operating cycle is concluded, and concluding said operating cycle by turning off said supplemental heating means in response to sensing by said tank water temperature sensing means of a water temperature at a predetermined temperature.

4,517,808
HEAT PUMPING SYSTEM

Avner Movshovitz, Tel Aviv, and Amos Ityel, Ramat Aviv, both of Israel, assignors to Amcor Ltd., Tel Aviv, Israel

Filed Mar. 29, 1984, Ser. No. 594,830
Claims priority, application Israel, Sep. 5, 1983, 69662
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—160 7 Claims

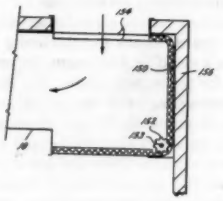


1. A heat transfer system comprising:
first, second and third controllable heat exchangers, each having a primary coil through which refrigerant is adapted to flow with said first and second heat exchangers further including at least a secondary coil in heat transfer contact with said primary coil for providing a separate path for fluid to flow therein and said third exchanger includes operable means for circulating fluid about the primary coil of the third exchanger;
a compressor having an inlet and an outlet for compressing gaseous refrigerant supplied thereto at its inlet and for providing compressed gaseous refrigerant at the outlet thereof;
a two-state flow path reversing valve having first, second, third and fourth ports, said valve providing two separate flow paths between its first and fourth ports and its second and third ports, when being in a first of its two states and further providing two separate flow paths between its first and second ports and its third and fourth ports when being in its second state;
expansion valve means for expanding liquid refrigerant supplied thereto to effectively reduce its pressure;
first means for providing a refrigerant flow path between the third port of the path reversing valve and the compressor's inlet, and between the compressor's outlet and the first port through the primary coil of said first exchanger;
second means for providing refrigerant flow path between said second and fourth ports through the primary coil of said second heat exchanger, said expansion valve means and the primary coil of said third heat exchanger connected thereby in series; and
control means including manually controllable switches for controlling said system whereby when said path reversing valve is in said first state either said first and second heat exchangers are operable as a condenser and an evaporator respectively while said third heat exchanger is inoperative or said third and second heat exchangers operate as a condenser and an evaporator respectively while said first heat exchanger is inoperative and when said valve is in its second state said first and second heat exchangers are connected in series with at least one of them being operable as a condenser while said third heat exchanger is operable as an evaporator.

4,517,809
ENERGY CONSERVATION SYSTEM FOR HEATING AND COOLING OF STRUCTURES

Wilber S. Hoyt, 406 Beverly Dr., Lafayette, La. 70503

Division of Ser. No. 207,120, Nov. 17, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 428,144
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—183 4 Claims



1. An energy conservation system for ventilating and heating of a structure substantially enclosing a refrigeration unit having a heat exchanger remotely disposed from the refrigeration unit, comprising:
a housing enclosing at least a portion of a heat exchanger;
an intake manifold communicating with said housing for providing a path for air to flow into the housing for contact with the heat exchanger, said intake manifold having a first inlet communicating with the air exteriorly of the structure and a second inlet communicating with the air interiorly of the structure;

a first damper means mounted with said intake manifold for selecting at least one inlet of air of said intake manifold for flow into said housing;

an exhaust manifold communicating with said housing for providing a path for air to flow from the heat exchanger, said exhaust manifold having a first outlet communicating with the air exteriorly of the structure and a second outlet communicating with the air interiorly of the structure;

a second damper means mounted with said exhaust manifold for selecting at least one outlet of the exhaust manifold for flow of effluent air out of the exhaust manifold, said second damper means selecting said second outlet to recover heat from said heat exchanger for warming the interior air of the structure when desired;

said first and second damper means include flexible gates comprising multiple interlocking sections which slide along channels within the housing and gear means for moving the flexible gates to select between alternate air passages, said interlocking sections having indentations for engagement with the gear means;

means in said housing for flowing air from said intake manifold into heat transfer contact with the heat exchanger and on into said exhaust manifold; and

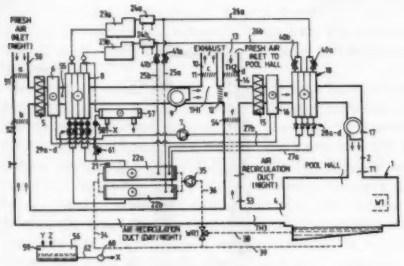
means for supplying exterior air into the structure when said first damper means is selecting flow of air from said second inlet and said second damper means is selecting said first outlet.

4,517,810

ENVIRONMENTAL CONTROL SYSTEM

Peter N. Foley, Shoeburyness, and Alan M. Turbard, Halstead, both of England, assignors to Borg-Warner Limited, Hitchin, England

Filed Dec. 16, 1983, Ser. No. 562,266
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—186 **8 Claims**



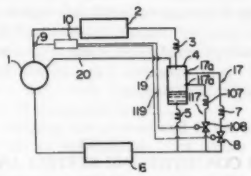
1. An environmental control system for controlling the condition of a space, including: a heat pump arrangement comprising an evaporator for recovering heat from air delivered thereto, a condensor for rejecting heat recovered by the evaporator to air to be delivered to the space; and means for delivering air from a selected source to the evaporator means to sense the temperature of said air, and control means, the means being operatively arranged so as, in one mode of operation, to deliver outside air to the evaporator and so that in the event of the evaporator entry air temperature falling to a level which could result in frosting of the evaporator, air re-circulated from the space is delivered to the evaporator to maintain the temperature above that level.

4,517,811

REFRIGERATING APPARATUS HAVING A GAS INJECTION PATH

Akira Atsumi; Kensaku Oguni; Shigeaki Kuroda, all of Shimizu; Takao Senshu, Ibaraki, and Kazuo Yoshioka, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,520
Claims priority, application Japan, Nov. 6, 1982, 58-193963
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—197 **10 Claims**



1. A refrigerating apparatus comprising:

a main refrigerant circuit including a compressor, a condenser, a first expansion device, a gas-liquid separator, a second expansion device and an evaporator which are successively connected through piping;

an injection path for interconnecting an upper part of said gas-liquid separator and a cylinder of said compressor during a compression stroke thereof;

at least one auxiliary path formed by connecting a solenoid valve closed in a normal operation and an auxiliary expansion device, said auxiliary path being provided between said gas-liquid separator and evaporator so as to be in parallel to said second expansion device, said auxiliary path being connected to said gas-liquid separator at a position higher than a connecting position of said second expansion device to said gas-liquid separator;

means for detecting a load on the refrigerating apparatus; and

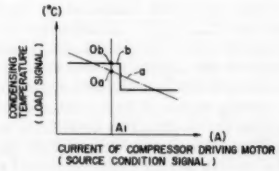
means for controlling an operation of the solenoid valve in response to a detection of the load on the refrigerating apparatus whereby said solenoid valve is opened when the load on said refrigerating apparatus increases.

4,517,812

LOAD CONTROL DEVICE FOR A HEAT-PUMP TYPE AIR CONDITIONING APPARATUS

Kenji Umezu, Shizuoka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 28, 1983, Ser. No. 489,497
Claims priority, application Japan, May 4, 1982, 57-73394
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—228.5 **9 Claims**



1. A load control device for a heat-pump type air conditioning apparatus of the type comprising a compressor, a condenser, an expansion member, and an evaporator which constitute a refrigerant circulation circuit, and in which said compressor is subject to load reduction control by an unloading circuit connected to said compressor and provided with an electromagnetic valve permitting refrigerant to flow from a

compression chamber of said compressor to a suction side of said compressor, comprising:

means for detecting a load condition applied to said compressor and for generating a load condition signal representing the detected load condition;

means for detecting a condition of a power source for driving said compressor and for generating a power source signal representing the detected condition of the power source; and

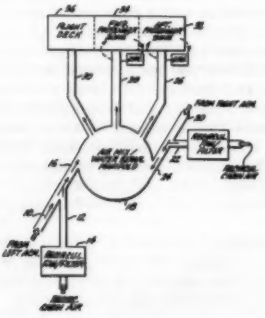
means for controlling switching of operation of the air conditioning apparatus between full-capacity operation and reduced-capacity operation in accordance with said power source signal and said load signal at least by actuating said electromagnetic valve in said unloading circuit according to said signals.

4,517,813

AIR CONDITIONING SYSTEM AND AIR MIXING/WATER SEPARATION APPARATUS THEREIN

John L. Eggebrecht, Bellevue; Harold D. Rogers, Woodinville, and Arthur S. Yorozu, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 5, 1983, Ser. No. 510,729
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—284 **4 Claims**



1. An air mixing and water separation apparatus, for mixing and separating water particles from a combined flow of fresh and recirculated air for delivery into an enclosure such as an airplane cabin, comprising:

(a) an elongate manifold having a lower end portion, an upper end portion and a midportion, the midportion extending along the longitudinal axis of the manifold and connected between the upper and lower end portions of the manifold, the interior longitudinal walls of the manifold having curved surfaces;

(b) one or more inlet ducts connected to the lower end portion for introducing the combined air flow into the manifold, the inlet ducts being substantially tangent to the interior walls of the manifold where the inlet ducts are connected to the lower portion, the tangential connection causing a swirling motion of the combined air wherein the water particles are projected by centrifugal force to impinge upon the interior longitudinal walls, the swirling motion also causing mixture of the combined air;

(c) one or more outlet ducts connected to the upper portion of the manifold for delivering the mixed air from the manifold to the enclosure;

(d) flow redirection means positioned between the inlet ducts and the outlet ducts for converting the swirling motion of the mixed air into substantially uniform flow across and perpendicular to the longitudinal axis of the manifold; and

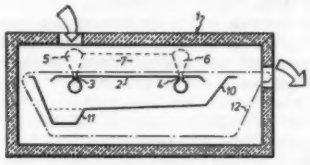
(e) scupper means affixed to the interior wall of the manifold for removing from the manifold the water particles impinged thereon.

4,517,814

APPARATUS FOR CONTINUOUS DIRECT TREATMENT OF PRODUCTS BY MEANS OF A FLUID COOLING MEDIUM

Sven O. Rothstein, Ängelholm, Sweden, assignor to Frigoscandia Contracting AB, Sweden

Filed Jan. 4, 1984, Ser. No. 568,101
Claims priority, application Sweden, Jan. 12, 1983, 8300135
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—374 **4 Claims**



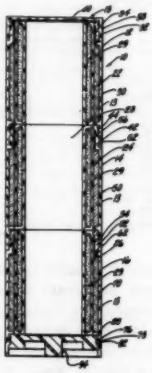
1. Apparatus for continuous direct treatment of products by means of a fluid cooling medium, said apparatus comprising a chamber having means therein for forming a liquid bed of the fluid cooling medium and having means for moving the products through the liquid bed in order to effect direct treatment of the products by the fluid cooling medium, said means for forming said liquid bed comprising a supporting surface beneath the bed, sidewall surfaces at opposite sides of the bed, and means for providing substantially vertically directed curtains of the fluid cooling medium at the ends of the bed for retaining the bed therebetween.

4,517,815

INSULATED MODULAR COOLER

Peter J. Basso, 425 Millstone Ct., Rochester, Mich. 48073

Filed Oct. 7, 1983, Ser. No. 539,937
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—457 **12 Claims**



1. A receptacle for storing and cooling food products comprising:

a tubular body having an open-ended body chamber comprising at least one first tubular member defining an open-ended chamber,

at least one annular housing in said at least one tubular

member, said housing having inner and outer wall portions spaced apart from each other to form a hollow chamber therebetween and means for closing the axial ends of said hollow chamber, each said at least one annular housing defining a cavity having open ends;

a layer of insulating material between each said first tubular member and each said annular housing,

detachable closure means for closing each open end of said tubular body, and

wherein said hollow chamber is filled with a freezeable refrigerant.

4,517,816

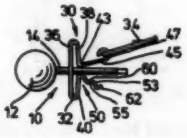
EARRING FASTENER

Herman A. Hess, 10 Eddystone Ave., Downsview, Ontario, Canada M3H 1H4

Filed Nov. 28, 1983, Ser. No. 555,300

Int. Cl.³ A44C 7/00; A44B 9/00

U.S. Cl. 63—12 **8 Claims**



1. A fastener for the stud of an ornament for pierced ears, the fastener having a gripping member and a latch,

(a) the gripping member comprising:

a base portion,

aperture means in the base portion through which a stud can pass,

a first resilient arm affixed to said base portion such that it can flex to move toward a stud when positioned to extend through said aperture means,

a second resilient arm affixed to said base in opposed relation to said first arm such that it can flex and move toward said first arm, whereby the arms can contact a stud on opposite sides thereof and squeeze the same,

(b) the latch being pivotally connected to said first arm and adapted to engage said second arm to draw the two arms toward each other, thus squeezing a stud positioned therebetween,

(c) the gripping member being formed from a band of resilient metal which is bent to define a substantially flat central region constituting said base portion, the aperture means being a hole substantially centrally of said flat central region, the central region having opposed ends remote from said hole, the first arm being an integral part of said band of metal and extending from one of said ends toward the hole, then undergoing a bend to extend away from the flat central region, and terminating in a hinged connected with said latch, the second arm being also an integral part of said band of metal and extending from the other of said ends toward the hole, then undergoing a bend to extend away from the flat central region while defining an indent engageable by said latch.

4,517,817

METHOD AND SETTING FOR MOUNTING ORNAMENTAL BEADS AND GEMS

Ed Levin, R.D. 1, Cambridge, N.Y. 12816

Filed Feb. 7, 1983, Ser. No. 464,404

Int. Cl.³ A44C 17/02, 17/04

U.S. Cl. 63—26 **8 Claims**

1. A method for mounting an ornament in a setting which comprises:

(A) providing a planar sheet metal support;

(B) providing an ornament having a straight-through opening;

(C) forming an aperture in said support, while

(D) forming a single rectilinear strip extending entirely across the aperture, both ends of said strip being in one piece with said support;

(E) shearing a single end of the strip from the support adjacent one side of the aperture while leaving the opposite end of the strip unitary with said support adjacent a different side of the aperture;

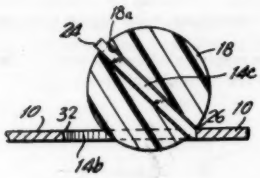
(F) flexing said strip about said opposite end from a position coplanar with the aperture;

(G) threading said strip through the straight-through opening in said ornament;

(H) bending said strip with the associated ornament back into the plane of the aperture; and

(I) frictionally wedging the sheared end of the strip against the adjacent side of the aperture from which it has been sheared.

5. Jewelry including



I. a setting on which on ornament with a straight-through opening is mountable, said setting comprising:

(A) a planar sheet metal support;

(B) an aperture formed in said support; and

(C) a rectilinear strip with two ends, said strip extending across the aperture in said support,

(i) both ends of said strip initially being in one piece with said support,

(ii) a single one of said ends being sheared from said support adjacent a side of the aperture;

(D) said strip being deformable about the non-sheared end to a position non-coplanar with the aperture in said support;

II. an ornament with a through-opening threaded onto said stop while said strip is in non-coplanar position;

III. the sheared end of said strip with the ornament thereon being deformed back to a position coplanar with the aperture and with the sheared end wedged against the side of the aperture from which it was sheared before the ornament was threaded thereon.

4,517,818

HIGH PRESSURE STEAMER FOR CONTINUOUS WET-HEAT TREATMENT OF A CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Aug. 9, 1983, Ser. No. 522,250

Claims priority, application Japan, Aug. 9, 1982, 57-138277; Aug. 9, 1982, 57-123278; Aug. 9, 1982, 57-138279; Nov. 17, 1982, 57-201391

Int. Cl.³ D06B 3/12, 23/22

U.S. Cl. 68—5 E **3 Claims**

1. A high pressure steamer for continuous wet-heat treatment of a cloth comprising:

a steamer body,

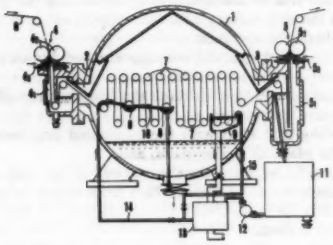
an inlet and an outlet for taking in and out a cloth continuously through the steamer body,

said cloth inlet having an inlet side seal mechanism provided with a liquid seal tank and said cloth outlet having an

outlet side seal mechanism provided with a slow cooling tank,

a plurality of liquid applying tanks and prewashing tanks for boiling the cloth passing through the steamer body,

a filter for cleansing waste water exhausted from the slow cooling tank,



a heat exchanger for heating the cleansed water with the use of high temperature waste liquor from the prewashing tanks, and

conduits for supplying the heated water to the liquid applying tanks and prewashing tanks.

4,517,819

METHOD AND APPARATUS FOR FORGING SPROCKET SEGMENTS

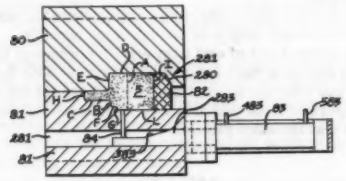
Gianni Sandroni, Sumirago, Italy, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 3, 1982, Ser. No. 446,819

Claims priority, application Italy, Oct. 9, 1981, 83647 A/81

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—353 **9 Claims**



1. A method of forging a sprocket segment (5) for a track-type vehicle undercarriage, including the steps of:

heating a metal billet (5') having a predetermined mass;

pressing said billet (5') in an open press to form a rough-shaped blank (5');

forging said blank (5') in a die (61) having predetermined dimensions and thereby forming a sprocket segment (5) having a size and shape substantially equal to the desired finished shape of the segment (5);

trimming said forged segment (5); and

applying external forces to the forged segment from at least three different directions to simultaneously coin at least two nonparallel surfaces (A,B,C) of said forged segment (5) and to thereby form said surfaces (A,B,C) to a desired finished shape and dimension.

4,517,820

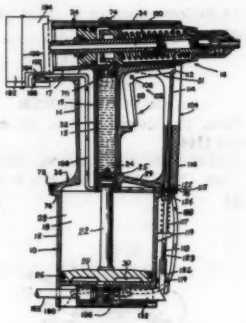
BLIND RIVET TOOL

Richard W. Oefinger, Shelton, and Richard J. Babyak, Trumbull, both of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 22, 1983, Ser. No. 506,659

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—391 **5 Claims**



1. A power operated blind rivet tool adapted to automatically pull the mandrel of a blind rivet to upset the rivet body in a workpiece comprising:

a. a one piece upper housing containing a rivet setting mechanism;

b. a one piece lower housing secured to the upper housing and having a power means to be operated by pressurized air to operate the rivet setting mechanism;

c. a control valve positioned in the bottom of the lower housing to control the supply of air to said power means;

d. said lower housing having a flange surrounding the control valve and forming a flat bottom area to the housing enabling the tool to be set on a flat surface;

e. said upper housing having a trigger area to be held by the tool operator and including a pivotal trigger having one end coacting with an upper trigger rod;

f. a lower trigger rod carried adjacent said lower housing and having an abutment coacting with the lower end of said upper trigger rod;

g. a shoe threaded into the lower end of the lower trigger rod;

h. a plunger connected to said control valve and having a sloped end coacting with the shoe so that upon pivotal movement of said trigger, the trigger rods are moved downwardly forcing said shoe down the sloped surface of the plunger causing the control valve to be opened to pressurize said power means.

4,517,821

AUTOMATIC TORQUE WRENCH TESTER

Kenneth J. Taggart, Columbia, Pa., and Kevin W. Traub, Pluckemin, N.J., assignors to K-D Tools, Inc., Lancaster, Pa.

Filed Oct. 26, 1983, Ser. No. 545,459

Int. Cl.³ G01L *25/00*

U.S. Cl. 73—1 C **18 Claims**

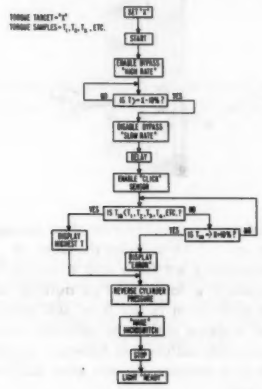
1. An automatic torque wrench testing machine having means for holding a torque wrench stationary relative to the frame of the machine, a torque drive shaft, and socket means interconnecting the wrench stud and the drive shaft, said machine including:

a. means for applying torque to said drive shaft;

b. means for selecting the rotational direction in which torque is applied to said drive shaft;

c. sensing means for generating electrical signals corresponding to the torque applied to said drive shaft;

d. a microprocessor;
e. means for setting a torque target value in said microprocessor;
f. means, including a comparator in said microprocessor, for comparing said generated signals with said preselected target signal;
g. means, including said microprocessor, for sensing that the signals developed by said sensing means are within a predetermined range of said target value and means in response thereto for reducing the torque applied to said drive shaft;
h. means, including said microprocessor, for identifying the



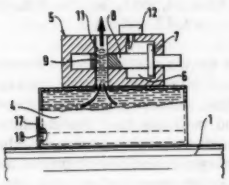
peak value of the signal generated by said sensing means at which said torque wrench "clicks", said "click" value being identified by an immediate sharp drop in the signal generated by said sensing means;
i. means, following identification of the "click" value, for sensing a predetermined number of succeeding signals;
j. means for comparing the peaks of said succeeding signals with peaks of prior signals;
k. means for displaying the highest signal peak;
l. means for terminating the application of torque to said drive shaft in said selected direction; and
m. means for returning said drive shaft in the opposite direction to a neutral position.

4,517,822

DEVICE FOR APPLYING IMBALANCE TO A ROTOR

Roland Bigret, Drancy, France, assignor to Alsthom-Atlantique, Paris Cedex, France

Filed Nov. 16, 1983, Ser. No. 552,229
Claims priority, application France, Nov. 16, 1982, 82 19122
Int. Cl.³ G01M *1/00*
U.S. Cl. 73—1 B **2 Claims**



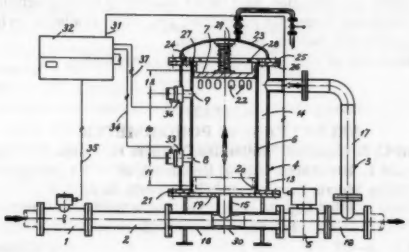
1. A device for applying imbalance to a rotor, comprising a plurality of chambers disposed symmetrically around said rotor and having an opening and adapted to contain a fluid, an opening device associated with each of said chambers and means for operating said opening devices under remote control so as to open said opening of an associated chamber so that fluid contained therein may be evacuated therefrom, each opening device comprising a pyrotechnic valve including a piston rigidly attached to an assembly and means for mounting said assembly relative to said opening for movement from a first position, wherein said assembly closes said opening of an associated chamber to a second position wherein said assembly opens said opening in response to firing of said pyrotechnic valve, and a control circuit incorporating a receiver responsive to a signal transmitted from a stationary source without a material transmission medium to fire said pyrotechnic valve.

4,517,823

TESTING DEVICE FOR FLOWMETER

Jürgen Böhm, Mannheim-Wallstadt, Fed. Rep. of Germany, assignor to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,737
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239281
Int. Cl.³ G01F *25/00*
U.S. Cl. 73—3 **12 Claims**



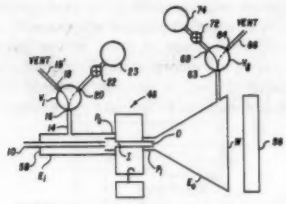
1. A testing device for a flowmeter arranged in a pipe, comprising
a bypass conduit connected in two connecting points with the pipe in which the flowmeter is arranged;
a gauge container arranged in said bypass conduit and selectively connectable in series with the pipe;
means for selectively connecting said gauge container in series with the pipe and including only one shut-off valve arranged between said two connecting points;
a measuring piston displaceable under the action of a fluid which flows into said gauge container over a measuring section having a beginning and an end, said measuring piston being arranged so that when said shut-off valve is open said measuring piston automatically displaces back to its start position under the action of its own weight;
start and stop switches arranged at the beginning and at the end of the measuring section, respectively, and operative for starting and stopping of addition of electric impulses from the flowmeter during displacement of said measuring piston;
means for comparing the impulses being added with a gauge volume of said measuring section; and
a measuring cylinder located in the interior of said gauge container, said measuring cylinder forming said measuring section and carrying said start and stop switches and said measuring piston, said gauge container and said measuring cylinder forming therebetween a pressure equalizing chamber.

4,517,824

SOLVENT DUMPING APPARATUS

Bruce D. Quimby, Landenberg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 1, 1983, Ser. No. 510,127
Int. Cl.[3] G01N *31/08*
U.S. Cl. 73—23 12 Claims



1. Solvent dumping apparatus for a gas chromatographic detector, comprising

an inlet enclosure having an outlet port for coupling to the inlet of a detector, said inlet enclosure having venting means and means for permitting sample gas, when present, to be introduced therein,

an outlet enclosure having an inlet port for coupling to the outlet of a detector, said outlet enclosure having venting means and means for permitting gas, when available, to be introduced therein, and wherein

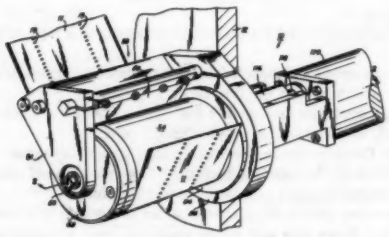
at least one of said venting means is controllable.

4,517,825

SELF-CLEANING POROSIMETER

Everett C. Grollimund, Midlothian; William H. Smick, III, and Donald L. Brookman, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,070
Int. Cl.[3] G01N *15/08*
U.S. Cl. 73—38 19 Claims



1. A self-cleaning porosimeter, comprising:

a housing having a surface, said surface having aperture means defined therein;

suction means for applying suction to said aperture means to exert suction on a web lying against and moving along said surface, the pressure in at least part of said suction means varying as a function of the porosity of the web surface;

transducer means for producing a signal representative of the porosity of the web responsive to said pressure in said suction means;

rigid blade means for lifting material adhering to said surface from said surface; and

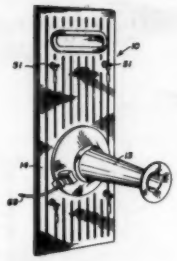
motor means for causing relative motion of said blade means and said surface for causing said blade means to clean said surface by said relative motion.

4,517,826

APPARATUS AND METHOD FOR DETERMINING THE AIR LEAKAGE CHARACTERISTICS OF A STRUCTURE

Charles Cole, and Wayne Cole, both of Winnipeg, Canada, assignors to Enercorp Management, Ltd., Winnipeg, Canada

Filed May 3, 1982, Ser. No. 373,971
Claims priority, application Canada, Jul. 17, 1981, 381943
Int. Cl.[3] G01M *3/26*
U.S. Cl. 73—40 20 Claims



1. In a method of determining the rate of air leakage into an enclosed structure and which includes the steps of:

continuously evacuating air from said structure by an air evacuation means at a determined air outflow rate;

continuing said evacuation of air from said structure and permitting the pressure within the structure to stabilize;

measuring the pressure differential between the interior of said structure and exterior thereto after stabilization of said pressure; and,

continuing said evacuation of air from said structure and then measuring the air outflow rate produced by said pressure stabilization;

the improvement comprising;

evacuating air from said structure through a calibrated long radius nozzle having a throat of fixed dimensions spaced upstream of said evacuation means, obtaining a measurement of the air outflow rate through said throat as expressed by the nozzle pressure in a multiple tap, static pressure averaging arrangement connecting with a sealed space defined by inner and outer walls of said long radius nozzle and connected with said throat; and,

determining from the measured information the air leakage characteristics of said structure.

4,517,827

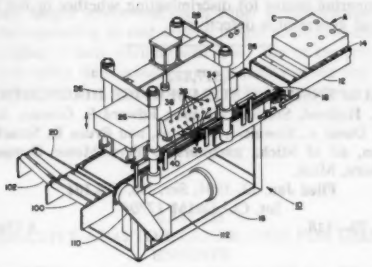
APPARATUS AND METHOD FOR TESTING FOR LEAKAGES IN HERMETICALLY-SEALED PACKAGES

Donald A. Tapscott, Cobourg, Canada, assignor to General Foods Incorporated, Don Mills, Canada

Filed Mar. 24, 1983, Ser. No. 478,435
Int. Cl.[3] G01M *3/36*
U.S. Cl. 73—45.4 23 Claims

1. An apparatus for the continuous, non-destructive testing for leaks in hermetically-sealed flexible packages having an internal vacuum that comprises: conveyor means for sequentially indexing said packages to a predetermined position in said apparatus; resistance sensor means including probes for contacting the packages at said predetermined position; indicator means operatively connected to said resistance sensor means for producing a signal indicative of the extend of vacuum as determined by resistance in each of the packages being contacted by the probes of said resistance sensor means; and means for receiving the tested packages from said apparatus

including a discharge conveyor, and a bypass conveyor for selectively receiving said tested packages from said discharge



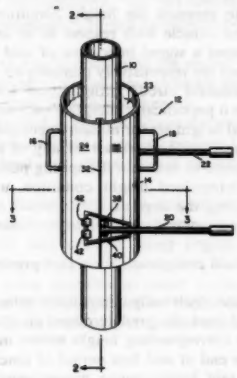
conveyor predetermined by response to said resistance sensor means indicating the presence of a leakage in said packages.

4,517,828

APPARATUS FOR LEAK TESTING OF PIPE

Darwin L. Miller, and Ronnie F. Miller, both of Houma, La., assignors to Damco Testers, Inc., Houma, La.

Filed Jun. 28, 1983, Ser. No. 508,464
Int. Cl.³ G01M *3/08*
U.S. Cl. 73—46 **13 Claims**



1. An enclosure for confining a liquid adjacent a test area in a fluid carrying conduit, said enclosure comprising:

(a) a sleeve positionable about a fluid carrying conduit in surrounding relationship with a test area, said sleeve including a pair of elongated body members hingedly connected to define a longitudinally openable sleeve;

(b) sealing means carried at the end of said sleeve and extending inwardly from said sleeve toward the conduit axis to engage the conduit in substantially liquid tight relationship therewith adjacent to the test area and to define a bottom wall of the enclosure; and

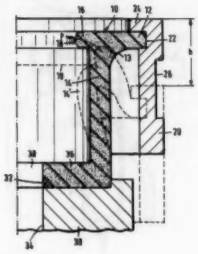
(c) retaining means carried by said sleeve to retain said enclosure around the test area to define an annular chamber for confining a liquid therewithin, said annular chamber having an annular opening at the end of said sleeve opposite the end carrying said sealing means to permit visual observation of liquid within the enclosure.

4,517,829

PNEUMATIC SEALING ARRANGEMENT

Heinz Krappitz, Reinbek; Hans-Peter Carstensen, Schenefeld, and Friedrich Weinhold, Norderstedt, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,895
Int. Cl.³ G01M *3/00*; B07C *5/00*
U.S. Cl. 73—49.8 **24 Claims**



1. An improved sealing apparatus for temporarily sealingly engaging the end of a cylindrical body so that air under pressure can be applied to the cylindrical body for testing thereof, the apparatus being of the type including a rotationally symmetrical sealing body of an elastomeric material for engaging the cylindrical body and support means for supporting and moving the sealing body into engagement with the end of the cylindrical body, the improvement wherein

said sealing body comprises

a hollow cylindrical portion having a sealing end and a fixed end; and

radially inwardly and outwardly extending flanges at said sealing end in substantially the same plane;

and said support means includes

means for holding said fixed end of said cylindrical portion;

axially movable gripping means for engaging said outwardly extending flange of said sealing body; and

means for axially moving said gripping means so that said outwardly extending flange moves toward the plane containing said fixed end to elastically deform and enlarge said inwardly extending flange to permit insertion of the end of said cylindrical body and away from said plane to return said outwardly extending flange to its original position in which the inner distal edge of said inwardly extending flange sealingly engages said cylindrical body.

4,517,830

BLOOD VISCOSITY INSTRUMENT

Damon M. Gunn, deceased, late of Washington, D.C., and Robert M. Gunn, administrator, 165 Beach Rd., Glencore, Ill. 60022

Filed Dec. 20, 1982, Ser. No. 451,529
Int. Cl.³ G01N *11/12, 11/04*
U.S. Cl. 73—57 **10 Claims**

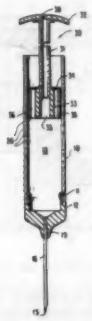
1. Blood viscosity measuring apparatus comprising in combination,

a hypodermic syringe for withdrawing a predetermined quantity of blood from a living body, said hypodermic syringe having a needle for entering a patient's body, a hypodermic plunger piston and a hollow body member for receiving said predetermined quantity of a patient's blood,

weight member in said hollow body member, said weight member having at least one elongated passageway therein adapted to permit said predetermined quantity of blood to relatively move from one known position in said hollow body member to another position through said at least one

elongated passageway at a rate determined by the viscosity of said blood,

said elongated passageway being defined by constricted passageway means formed in said hypodermic plunger piston, and check valve means for sealing said constricted passageway during the withdrawal of blood from said patient's body and permitting blood to flow through said constricted passageway during relative flow of said blood between said positions



timer means,

means for starting said timer means when said predetermined quantity of blood is at said one known position and stopping said timer means when said predetermined quantity of blood is at said another position,

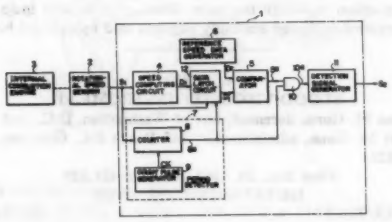
display means for displaying the time of relative movement of said predetermined quantity of blood between said positions as a measure of the viscosity of said blood from said patient's body.

4,517,831

TROUBLE DETECTING APPARATUS FOR A SENSOR IN AN INTERNAL COMBUSTION ENGINE SYSTEM

Yutaka Hirano, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed Nov. 23, 1983, Ser. No. 554,606
Claims priority, application Japan, Nov. 25, 1982, 57-205558
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **10 Claims**



1. A trouble detecting apparatus for detecting trouble in a signal generator which generates an electric signal whose period changes in accordance with the rotational speed of an internal combustion engine, comprising:

a computing means responsive to said electric signal for computing the rotational speed of the internal combustion engine;

a detecting means for detecting whether or not the period of said electric signal exceeds a predetermined time;

a comparing means for comparing the result of the computation in said computing means just before the period of said electric signal exceeded said predetermined time with a reference rotational speed in response to the results from said detecting means and said computing means; and

means responsive to the result of the comparison in said comparing means for discriminating whether or not said signal generator is defective.

4,517,832

AIR SUSPENSION SYSTEM SERVICE DIAGNOSTICS

Scott B. Holland, Sterling Heights; Edward S. Greene, Allen Park; David A. Kowalski, Romulus, and Bruce D. Strachan, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1984, Ser. No. 570,101
Int. Cl.³ G01M *17/04*
U.S. Cl. 73—118 **6 Claims**

1. A method of diagnosing an air suspension system of an automotive vehicle, which includes a plurality of air pressure responsive springs connected between sprung and unsprung components of the vehicle, and an electrically controlled solenoid air valve on each air spring, at least one electrically energized height sensor mounted between sprung and unsprung components to measure the height condition of the sprung portions of the vehicle with respect to its unsprung components and output a signal indicative of said measurement, a compressor unit for responsively pumping air to each solenoid valve and a control circuit programmed for an operational mode wherein it periodically energizes each said height sensor, reads each said height sensor measurement output and responsively energizes said compressor or any of said solenoid air valves as required to maintain the sprung portion of said vehicle at a predetermined height condition, and a diagnostic mode, comprising the steps of:

switching said control circuit into its controlled diagnostic mode;

energizing said compressor for a first predetermined period of time;

opening a first electrically controllable solenoid air valve for each of at least one predetermined air spring;

reading the corresponding height sensor measurement output at the end of said first period of time;

comparing said height sensor measurement output with a predetermined measurement indicating a fully raised condition for said at least one predetermined air spring;

with said compressor in its de-energized state, opening said first electrically controllable solenoid air valve for each of said at least one predetermined air spring for a second predetermined period of time;

reading the corresponding height sensor measurement output at the end of said second predetermined period of time;

comparing said height sensor measurement with a predetermined measurement indicating a fully lowered condition for said at least one predetermined air spring;

energizing said compressor for a third predetermined period of time;

opening said first electrically controllable solenoid air valve for a third predetermined period of time;

reading said corresponding height sensor measurement output during said third predetermined period of time;

comparing said height sensor measurement with a predeter-

mined measurement corresponding to a desired height condition;

closing said valve and de-energizing said compressor when said height sensor reading is equal to said measurement corresponding to said desired height condition; and

providing a fault warning whenever any of the preceding comparing steps results in an inequality at the end of the respective first, second and third time periods.

4,517,833

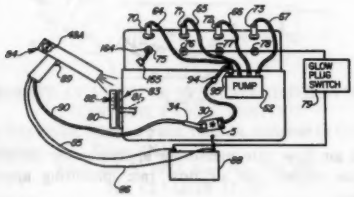
INDUCTIVE ADAPTOR/GENERATOR FOR DIESEL ENGINES

William M. Wesley, 21956 North Hickory Hill Dr., Kildeer, Ill.

Filed Mar. 18, 1983, Ser. No. 476,692

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **9 Claims**



1. An adaptor for monitoring the performance of diesel engines with instrumentation having an inductive-type pickup, comprising

a transducer device to be coupled to the engine for monitoring the performance of a selected cylinder and producing an electrical signal in response thereto;

circuit means coupled to said transducer for processing said signal to derive a further signal in response to the occurrence of at least one characteristic of said transducer signal;

field generating means coupled to said circuit means and having an exterior contour for creating a concentrated magnetic field, said contour being engageable by the inductive pickup of said instrumentation, said field generating means being operable to create a change in field strength of sufficient magnitude to excite said inductive pickup upon occurrence of said further signal.

4,517,834

TIRE PRESSURE SENSING SYSTEMS

Douglas V. Luke, Farnham Common, England, assignor to Smiths Industries Public Limited Company, London, England

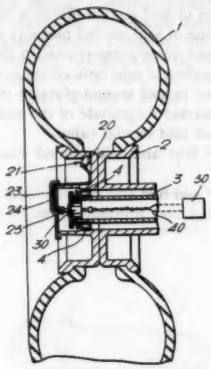
Filed Mar. 14, 1984, Ser. No. 589,444

Claims priority, application United Kingdom, Mar. 23, 1983, 8307986

Int. Cl.³ B60C *23/02*; G01L *7/06*

U.S. Cl. 73—146.5 **10 Claims**

1. A tire pressure sensing system comprising: a pressure sensor mounted for rotation with a tire; an optical radiation guide mounted for rotation with the tire, said sensor supplying optical output signals to said radiation guide, said radiation guide directing the optical output signals to a location substantially coaxial of said tire; optical receiver means; and means mounting said receiver means on a stationary member coaxial of said tire and aligned to receive said optical output signals from the radiation guide, said receiver means supplying signals



indicative of tire pressure to a location remote from said receiver means.

4,517,835

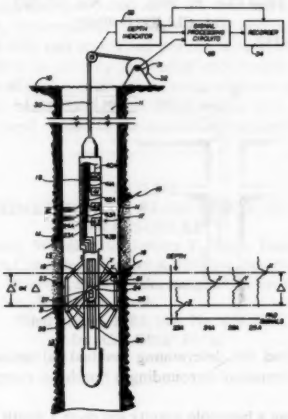
METHOD FOR DETERMINING FORMATION DIP

Mark G. Kerzner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 19, 1983, Ser. No. 533,177

Int. Cl.³ E21B *49/00*

U.S. Cl. 73—152 **10 Claims**



1. A method for determining dips of subsurface earth formations traversed by a borehole, comprising:

deriving a plurality of indications of dip directions of said formation at each corresponding one of a plurality of depths within said borehole;

selecting from said indications a first plurality of indications;

determining first differences in magnitude between each said indication of said first plurality of indications and an adjacent one of said first plurality of indications;

deriving a first value proportional to the difference between the number of indications in said plurality of indications and in said first plurality of indications;

determining a first magnitude of the sum of said first differences and said first value;

selecting from said indications a second plurality of indications;

determining second differences in magnitude between each said indication of said second plurality of indications and an adjacent one of said second plurality of indications;

deriving a second value proportional to the difference between the number of said indications in said plurality of indications and in said second plurality of indications;

determining a second magnitude of the sum of said second differences and said second value;

comparing said first and said second magnitudes of said sums; and

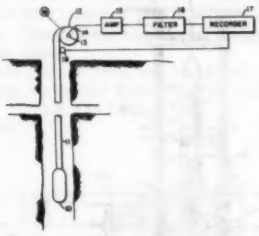
selecting one of said first and second plurality of indications as indicative of said formation dips in response to said comparison.

4,517,836

METHOD FOR DETERMINING OIL SATURATION IN A SUBSURFACE FORMATION

W. D. Lyle, Jr., Grapevine, and Luke S. Gournay, Rockwall, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 25, 1983, Ser. No. 545,333
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—152 **4 Claims**



1. A method for determining residual oil saturation in a subsurface formation surrounding a borehole, comprising the steps of:

a. producing a borehole gravity log over a depth interval in said borehole;

b. measuring the bulk density of the subsurface formation surrounding said borehole from said gravity log;

c. producing a resistivity log over said depth interval in said borehole;

d. measuring the bulk resistivity of the subsurface formation surrounding said borehole from said resistivity log by deriving a weighted average of the individual resistivity measurements taken from said resistivity log from a series of equally spaced points over said depth interval, and

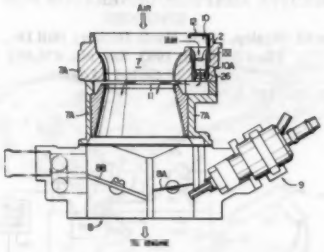
e. combining said formation bulk density and formation bulk resistivity measurements to derive a measurement of residual oil saturation whereby the effects of porosity in both said bulk density and bulk resistivity measurements on the residual oil saturation measurement are minimized.

4,517,837

AIR FLOW RATE MEASURING APPARATUS

Yoshishige Oyama; Teruo Yamauchi, both of Katsuta; Mamoru Fujieda, Ibaraki; Yutaka Nishimura, Katsuta; Takao Sasayama; Shinichi Sakamoto, both of Hitachi; Hisanori Moriya, Katsuta; Takeshi Atago, Katsuta; Kanemasa Sato, Katsuta; Yoshikazu Hoshi, Ibaraki; Sadayasu Ueno, Katsuta; Tadahiko Otani, Katsuta, and Mineo Kashiwaya, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 28,889, Apr. 10, 1979, abandoned. This application Aug. 10, 1983, Ser. No. 521,901
Claims priority, application Japan, Apr. 10, 1978, 53-42547
Int. Cl.³ G01F *5/00*
U.S. Cl. 73—202 **18 Claims**



18. An air flow rate measuring apparatus for an internal combustion engine, the air flow rate measuring apparatus comprising:

a venturi means disposed upstream of a throttle valve arranged in an intake line of the internal combustion engine, a bypass means for allowing an air flow therethrough, said bypass means being spaced from said venturi means and having disposed therein an electrical flow sensor means for sensing flow rate in an air flow including a temperature-dependent resistor means for sensing a heat transfer between the resistor means and the air thereby enabling a measuring of the air flow rate, an inlet of said bypass means is disposed in a full non-restricted cross section of said venturi tube, said bypass means terminates through an opening into the region of said venturi means, a ratio of flow rate through said bypass means to a flow rate through said venturi means is set at a predetermined value,

guide means disposed in the bypass means including a first substantially curved guide portion for uniformly distributing the air flow and a second substantially straight guide portion for increasing the flow rate of air passing in the bypass means, and

a support member fixedly clamped in said second substantially straight guide portion of said bypass means for mounting the flow sensor means in the bypass means.

4,517,838

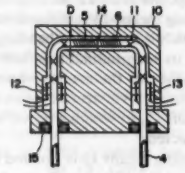
THERMAL MASS FLOW METER

Akira Wachi, and Munehisa Hayashi, both of Tokyo, Japan, assignors to Ohkura Electric Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,389
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 **5 Claims**

1. A thermal mass flow meter, comprising a case whose heat conductivity is much larger than that of air, a fine groove with an equivalent diameter of not larger than 4 mm bored through the case, a sensor pipe disposed in said fine groove so as to

carry a fluid flow to be measured therethrough, and means for supporting said sensor pipe in said groove in spaced relation-



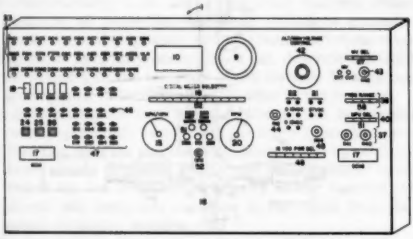
ship with said case, and a heating and temperature-sensing means mounted on said sensor pipe.

4,517,839

OFF-HIGHWAY VEHICLE SYSTEMS SIMULATOR AND CONTROL PANEL TESTING

Harry Van Dyke, Niagara Falls, Canada, assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Filed Jul. 5, 1983, Ser. No. 510,759
Int. Cl.³ G01R *31/00*
U.S. Cl. 73—432 R **20 Claims**



19. A method of out of vehicle testing of electronic control panels for an off-highway vehicle comprising the following steps:

removing an electronic control panel to be tested from a vehicle;

electrically coupling an electronic control panel to be tested to an apparatus that can provide electrical signal ranges to an electronic control panel which simulate the operating signals directed to an electronic control panel when in an operating vehicle;

manipulating the electrical signal ranges being directed to an electronic control panel so that the signals are at levels dictated by previously established standards;

mainpulating switching means so that the correct electrical signals are directed to the correct circuit in an electronic control panel;

measuring the output signals of an electronic control panel in response to the inputted electrical signals;

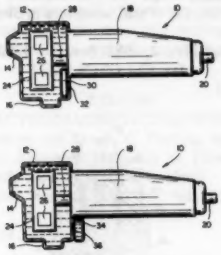
comparing the measured output signals with established output signals for correctly operating electronic control panels; and recalibrating, where necessary, specific circuits within an electronic control panel that has been tested.

4,517,840

ULTRASONIC SECTOR SCANNER HAVING FLUID REPLACEMENT CAPABILITY

Craig R. Thompson, Rancho Cordova; Ronald C. Carnes, Folsom, and Ted F. Naumann, Jr., Shingle Springs, all of Calif., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 434,826, Oct. 18, 1982, abandoned.
This application Nov. 2, 1984, Ser. No. 667,397
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—644 **3 Claims**



1. A hand-held scanner for use in ultrasonic medical diagnostic systems comprising

a housing having a sealed end portion,

a shaft rotatably mounted in said housing,

a motor mounted within said housing and coupled to rotate said shaft,

a transducer assembly coupled to said shaft and positioned in said sealed end portion,

a fluid in said sealed end portion and displacing essentially all air therefrom, and

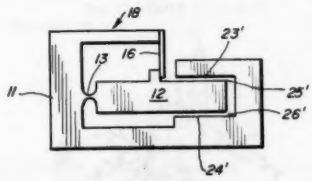
a pliable, impermeable bladder means cooperatively arranged with said sealed end portion to automatically prevent air from entering said sealed end portion as a consequence of fluid escaping from said sealed end portion, said bladder means being positioned within said sealed end portion and vented to the outside atmosphere.

4,517,841

ACCELEROMETER WITH BEAM RESONATOR FORCE TRANSDUCER

Rex B. Peters, Woodinville; Jeffrey F. Tonn, Tacoma; Arnold Malametz, Carnation; Richard A. Hilliker, Seattle, and Victor B. Corey, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 6, 1983, Ser. No. 456,254
Int. Cl.³ G01P *15/10*
U.S. Cl. 73—517 AV **17 Claims**



1. In an accelerometer having a base, a proof mass hinged to the base to respond to an acceleration and a brittle, bidirectional, beam resonator force transducer having one end connected to the proof mass and the other end connected to the base, the output of the force transducer being a measure of the

acceleration sensed by the proof mass, the improvement comprising:

a compliant mount having a bidirectional, linear and continuous force/deflection characteristic, interposed between the other end of the force transducer and the base to extend the range of movement of the proof mass without subjecting the force transducer to an excessive force.

4,517,842

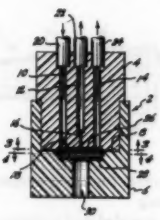
FLUID PRESSURE TRANSDUCER

James R. Twomey; Hugh W. McCutcheon, and Richard K. Harris, all of Seattle, Wash., assignors to Slope Indicator Co., Seattle, Wash.

Filed Nov. 2, 1982, Ser. No. 438,594

Int. Cl.³ G01N *33/24*

U.S. Cl. 73—701 **28 Claims**



1. A fluid pressure transducer which comprises:

a body member which contains a porous element;

a control fluid inlet means in communication with the porous element;

a thin diaphragm having first and second faces mounted in proximity to the porous element, the diaphragm associated with the body member to serve as a fluid tight barrier between the porous element and control fluid inlet means and a fluid whose pressure is to be measured so that control fluid may be transmitted through the fluid inlet means and porous element to exert a uniform pressure against the first face of the diaphragm; and

sensing means associated with the diaphragm in order to sense diaphragm movement when the control fluid pressure equals or exceeds the pressure of the fluid bearing against the second face of the diaphragm.

4,517,843

MATERIAL AND COMPONENT TESTING MACHINE

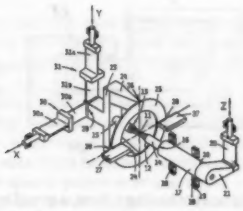
Joachim Leger, Adolf-Eiermann-Strasse 13, 6930 Eberbach, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,706

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244464

Int. Cl.³ G01N *3/22, 3/20*

U.S. Cl. 73—847 **11 Claims**



1. A material and component testing machine for providing random length bending and/or torsion loads in preferably bar-shaped testing samples, characterized by the following features:

(a) clamping means **14, 15** are provided for engaging a test sample at its opposite ends **12, 13** respectively;

(b) the one clamping means **14** is situated at the front end **16** of a shaft **17** which is resistant to bending and torsion and rotatable about its longitudinal axis and mounted in two bearings **18** attached to the machine frame **19**;

(c) a radially projecting lever arm **21** is connected to the rear end **20** of the shaft **17**, to which a power source creating a force Z is connected;

(d) the other clamping means **15** is situated in the center of a yoke **23** which is resistant to bending and torsion at a back end **29** to which power sources creating forces X,Y are connected respectively, said forces being applied at right angles to each other; and

(e) the yoke **23** is supported on the machine frame through its two arms **24** via a cardan joint **24-28**.

4,517,844

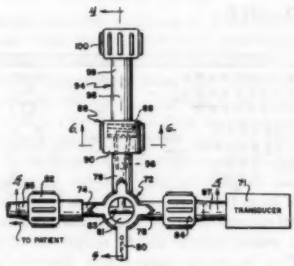
FLUID DAMPING DEVICE FOR A COMPLIANT SYSTEM

Steven Powell, 341 W. Harding, Lombard, Ill. 60148

Filed Jun. 3, 1983, Ser. No. 500,940

Int. Cl.³ A61B *5/02*; G01L *19/00*

U.S. Cl. 73—707 **10 Claims**



1. In a compliant fluid flow system including flexible tubing of a fixed length, said system having a characteristic hydraulic impedance determined by the length of said tubing and including pressure sensitive means for measuring the pressure in said system, apparatus for increasing the accuracy of said pressure measurements by compensating for the resonance of said system, said apparatus comprising:

an inlet port coupled to said fluid flow system;

a plurality of elongated tubes each having a proximal end, a distal end and a predetermined length and including:

an internal structure defining a cavity therein with the volume of said cavity increasing with increasing tube length;

first sealing means located on the distal end of said tube for forming a closure therefor; and

second sealing means located on the proximal end of said tube for forming a partial closure having a fixed resistance wherein when the proximal end of a designated tube is inserted in said inlet port, a compliant air cavity having a characteristic impedance determined by the volume of said cavity is formed such that the resonance of said system may be compensated for by insertion in said inlet port of the one of said plurality of elongated tubes having an impedance which matches the characteristic impedance of said fluid flow system.

4,517,845

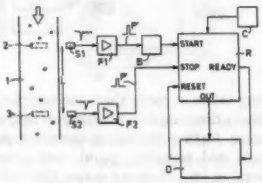
METHOD AND APPARATUS FOR DETERMINING THE FLOW VELOCITY OF A MOLTEN, RADIATION-EMITTING MATERIAL

Anders P. Ransheim, Helsingborg; Arne Thomsen, Astorp, and Per Holmgren, Angelholm, all of Sweden, assignors to Gullfiber AB, Billesholm, Sweden

Continuation-in-part of Ser. No. 414,337, filed as PCT SE/00372, Dec. 14, 1981, published as WO 82/02094 Jun. 24, 1982, § 102(e) date Aug. 16, 1982, abandoned. This application Jun. 2, 1983, Ser. No. 501,630 Claims priority, application Sweden, Dec. 16, 1980, 8008840; Jun. 11, 1982, 8203650

Int. Cl.³ G01F *1/70*

U.S. Cl. 73—861.05 **16 Claims**



1. A method for measuring the flow velocity of a flow, stream or jet of a molten radiation-emitting material, comprising the steps of

(a) detecting the intensity of the radiation emitted from a limited section of the material flow at two separate locations, which are spaced apart by a predetermined distance along the path of the flow, and generating corrresponding electric signals,

(b) discriminating from said signals from said two detecting locations all pulse-like amplitude variations exceeding a predetermined amplitude, said amplitude variations originating from randomly occurring, local, descrete deviation in the intensity of the radiation of the material flow caused by the presence of local inhomogeneities in the material,

(c) determining the time interval between the occurrence of such an amplitude variation in the signal from the upstream detecting location and the occurrence in the signal from the down-stream detecting location of the amplitude variation caused by the same inhomogeneity in the material which caused said amplitude variation in the signal from the upstream detecting location, and

(d) using said time interval as a measure of the time of travel of the material flow over said predetermined distance between said two detecting locations for calculating the flow velocity of the material flow.

10. An apparatus for measuring the flow velocity of a flow, stream or jet of a molten radiation emitting material comprising

(a) two radiation detectors arranged to receive radiation emitted from a limited section of the material flow at two different locations spaced apart by a predetermined distance along the flow path of the material flow and to produce an electric output signal each corresponding to the intensity of said received radiation.

(b) for each radiation detector a signal-processing circuit for discriminating from the output signal of said radiation detector only such pulse-like amplitude variations which exceed a predetermined magnitude and to produce corresponding signal pulses on its output,

(c) a time measuring circuit having a start input connected to the output of the signal-processing circuit associated with the upstream detector for receiving signal pulses therefrom, a stop input connected to the output of the signal-processing circuit associated with the downstream detector for receiving signal pulses thereform, and an output, for providing on said output successive values representing respective measured time intervals between a signal pulse received on said start input and a subsequent signal pulse received on said stop input,

(d) a gating circuit inserted between the start input of said time-measuring circuit and the output of the signal-processing circuit associated with the upstream detector for allowing through only such signal pulses on the output of said amplifier which are preceded by a predetermined period of time being selected to exceed the maximum expected time of travel of said material flow over said predetermined distance, and

(e) a calculating unit connected to the output of said time-measuring circuit for receiving the successive values appearing on said output, each representing a said measured time interval, and for using said values as a measure of the travel time of the material flow over said predetermined distance for calculating the flow velocity of the material flow.

4,517,846

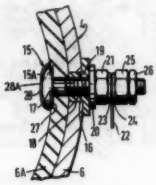
ELECTROMAGNETIC FLOWMETER

Derek N. Harrison, and Trevor C. Purling, both of Gloucestershire, United Kingdom, assignors to Flowmetering Instruments Limited, Gloucestershire, England

Filed Jun. 13, 1983, Ser. No. 503,583

Int. Cl.³ G01F *1/58*

U.S. Cl. 73—861.12 **9 Claims**



1. An electromagnetic flowmeter comprising a flow tube for conducting the fluid or slurry whose flow rate is to be monitored, magnetic field generating means for producing a magnetic field within the flow tube transverse to the axis of the tube, and a pair of electrodes mounted on opposite sides of the tube for detecting the resultant e.m.f. induced across the flowing fluid or slurry transversely to the magnetic field and for thereby providing an output signal proportional to the flow rate of the fluid or slurry, wherein at least one of the electrodes is coated with a porous electrically insulating material to decrease the level of noise component of the output signal.

4,517,847

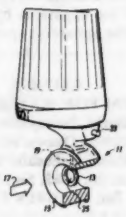
FLOWMETER HAVING UNIFORM RESPONSE UNDER BOTH LAMINAR AND TURBULENT FLOW CONDITIONS

Richard W. Miller, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Oct. 27, 1982, Ser. No. 437,062

Int. Cl.³ G01F *1/40, 1/28*

U.S. Cl. 73—861.74 **5 Claims**



1. An improved fluid flowmeter of the type in which a fluid

stream within a conduit exerts a force on a target body centrally positioned within said conduit, said force being related to the differential pressure created by said target body and proportional to the square of the velocity of said fluid stream, and having means for corelating said force to a measurement of said velocity, wherein said improvement comprises:

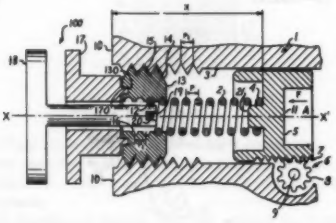
target body means, having an aperture extending completely through said target body in the direction of fluid flow, for subjecting said target body to only those portions of laminar and turbulent flow profiles which are substantially identical, whereby said flowmeter responds uniformly under both laminar and turbulent flow conditions.

4,517,848

APPARATUS FOR MEASURING FORCES

Raymond Faure, Veyre Monton, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 17, 1983, Ser. No. 476,360
Claims priority, application France, Apr. 1, 1982, 82 05847
Int. Cl.³ G01L *1/26*
U.S. Cl. 73—862.52 **9 Claims**



1. An apparatus for measuring forces, characterized by the following features:

(a) a coil spring within a body;

(b) a movable part within the body, the movable part being subjected to the action of a force to be measured and being in contact with one end of the coil spring;

(c) means to visualize the correlation between the position of the movable part within the body and the value of the force;

(d) an adjustment sleeve within the body with an external thread which can be screwed into an internal thread of the body, the adjustment sleeve being in contact with the other end of the coil spring;

(e) the adjustment sleeve has an internal thread within which the coil spring can be screwed;

(f) the external and internal threads of the adjustment sleeve have the same pitch;

(g) first means adapted to receive removable means to selectively prevent the coil spring from rotating within the body;

(h) second means adapted to receive removable means to selectively adjust the position of the adjustment sleeve within the body; and

(i) said first and second means may each be actuated directly from outside of the apparatus by said removable means without taking the apparatus apart.

4,517,849

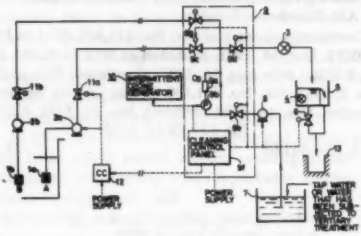
SAMPLING SYSTEM FOR WATER QUALITY SENSORS

Ichiro Nakahori; Shigeki Nakayama; Mitsuo Maeda; Shiro Yamauchi, and Junichiro Ozawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 506,259
Int. Cl.³ G01N *1/16*
U.S. Cl. 73—863.31 **1 Claim**

1. In a sample system including means for directing water samples to at least one water quality sensor for analysis, the improvement comprising:

means for supplying ozone-containing cleaning water to areas of said system which come into contact with said water samples,



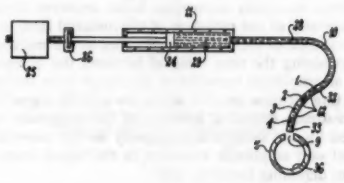
said samples being taken at more than one sampling point and being sequentially directed to a plurality of said sensors, and said sample system further including sampling pump means proximate each said sampling point, and cleaning pump means for directing said cleaning water through said areas.

4,517,850

SAMPLE HANDLING METHOD AND APPARATUS

Alan G. Wiseman, Glen Waverley, and John T. Huberts, Mount Waverley, both of Australia, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 5, 1982, Ser. No. 405,445
Claims priority, application Australia, Aug. 5, 1981, PF0064
Int. Cl.³ B01L *3/02*; G01N *35/06*
U.S. Cl. 73—864.21 **11 Claims**



1. A sample handling method including the steps of filling a conduit with a rinse solution, drawing a first slug of air into an end of said conduit, drawing in sequence into said conduit end a plurality of ingredients of a sample mixture including a blank solution, a standard and a sample solution, drawing into said conduit end a further slug of air immediately following the uptake of each said ingredient so that a slug separates each two adjacent ingredients and is the last component in the series of components within said conduit, each said slug and each said ingredient displacing a respective quantity of said rinse solution from said conduit at the time of its uptake, locating said conduit end at an atomizer furnace, and discharging said ingredients in succession through said conduit end in a single operation to be deposited within said furnace.

4,517,851

SYSTEM FOR CONTROLLING SEPTUM DAMAGE

Gregory Tiee, Lutherville, Md., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed May 20, 1983, Ser. No. 496,716
Int. Cl.³ G01N *35/00*
U.S. Cl. 73—864.91 **30 Claims**

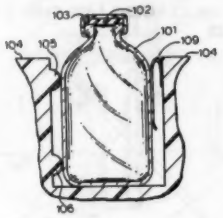
1. A system for locating a vial comprising

a. a vial carrier comprising a well,

b. a vial having a cross sectional shape which permits insertion in said vial carrier, said vial having a body portion, a finish, an opening in said finish and a penetrable septum disposed in said opening,

c. said septum being penetrated by at least one needle at periodic intervals, and

d. locating means within said vial carrier for establishing a



predetermined location for said vial in relation to said needle, said locating means fixing the location of the vial within the well while placed therein, said locating means including a plurality of contact points and urging means for establishing contact between said contact points and a locating surface, said urging means pressing substantially on one side of said vial, which side is substantially opposite said locating means.

4,517,852

CARRIAGE APPARATUS

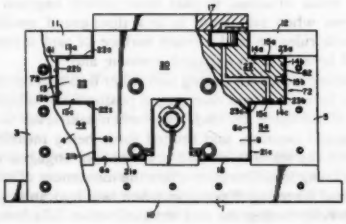
Kouichi Kawakami, Zama, and Mamoru Tanaka, Yokohama, both of Japan, assignors to Nippin Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,289

Claims priority, application Japan, Jun. 4, 1980, 55-74205; Jul. 2, 1980, 55-92103[U]; Jul. 18, 1980, 55-97572

Int. Cl.³ F16H *29/20;* F16C *32/06*

U.S. Cl. 74—89.15 **6 Claims**



1. A carriage apparatus including a base bed generally having the shape of an upwardly opening container and provided with a first recess at the bottom thereof and second and third recesses in the opposite inner side portions, and a movable carriage generally having a shape that can be contained in said base bed and provided with a first protruded portion corresponding to said first recess at the bottom thereof and second and third protruded portions corresponding to said second and third recesses in the opposite outer side portions thereof, drive means including a feed screw for moving said carriage within said base bed, means for supplying compressed gas to the gap between said second protruded portion and said second recess and the gap between said third protruded portion and said third recess to form static pressure gas bearings, and means including a predetermined amount of liquid stored within the gap between said first protruded portion and said first recess for producing a squeeze damping effect so that self-excited vibration of said carriage by said static pressure gas bearings is restrained.

4,517,853

BALANCING DEVICE

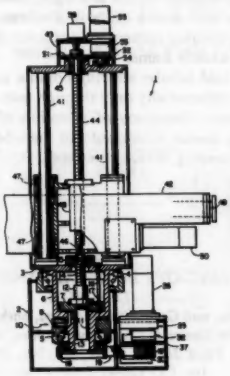
Shigetaka Tani, and Toshio Nagahara, both of Toyama, Japan, assignors to Toyama Machine Works, Limited, Toyama, Japan

Filed Feb. 12, 1982, Ser. No. 348,613

Claims priority, application Japan, Feb. 16, 1981, 56-21232

Int. Cl.³ F16H *27/02, 29/02*

U.S. Cl. 74—89.15 **14 Claims**



1. A balancing device, comprising:

a driving electric motor;

a feed screw turned by said motor;

a balancing feed screw coupled to said feed screw; and

a balancing cylinder coupled through thread means to said balancing feed screw, to apply torque to said balancing feed screw to reduce the load exerted on said motor.

4,517,854

LOW-VIBRATION STEERING DEVICE

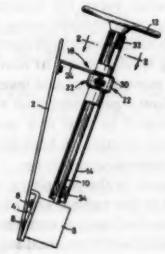
Yasuhiro Kawabata, Obu; Yoshio Kadokawa, Nagoya; Nobuyuki Mori, Nagoya, and Shinji Suzuki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan

Filed Nov. 15, 1982, Ser. No. 441,764

Claims priority, application Japan, Nov. 25, 1981, 56-174823[U]

Int. Cl.³ B62D *1/16;* F16C *27/06*

U.S. Cl. 74—492 **15 Claims**



1. A low-vibration steering device for a vehicle, comprising:

a gearbox provided on a chassis frame of the vehicle,

a steering shaft rotatably supported by said gearbox at a lower end thereof,

a steering wheel provided on an upper end of said steering shaft,

a tubular steering column enclosing said steering shaft and rotatably supporting said steering shaft by at least one annular insert interposed between an inner wall of said tubular steering column and an outer wall of said steering shaft, said tubular steering column being mechanically isolated from direct connection to said chasis frame, said gearbox and a floor of the vehicle, and

a column clamp holding said tubular steering column at a portion thereof which is longitudinally above a middle portion and near a node in a vibrational mode of said tubular steering column, said column clamp being secured to said chassis frame,

whereby said tubular steering column is supported by said chassis substantially only through said column clamp, and the natural frequency of vibration of the whole of the steering device is reduced and the vibration in the whole of the steering device is reduced.

4,517,855

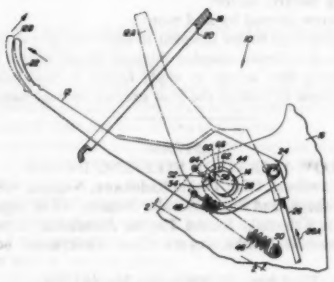
POWER TAKE-OFF LEVER ARRANGEMENT FOR A TRACTOR

Lloyd L. Lane, and Gregory S. Hosford, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 12, 1982, Ser. No. 397,636

Int. Cl.³ G05G *5/08;* F16B *3/00*

U.S. Cl. 74—528 **6 Claims**



1. An improved power take-off lever arrangement for a tractor having a support plate secured to said tractor and having a pin extending outward therefrom which engages an aperture formed in a manually operable lever, said lever being connected to a control valve for hydraulically engaging a power take-off drive, said control valve being responsive to move to a second position with corresponding movement of said lever and being spring biased to move to a first position with corresponding movement of said lever when said hydraulic pressure falls below a predetermined value, said lever further being spring biased to said first position such that an attachment mechanism formed on both said lever and said pin engages, said improvement comprising:

(a) a keyway formed in the periphery of said pin which is aligned parallel to the central axis of said pin; and

(b) a key formed on the inner circumference of said aperture which is formed in said lever, said key being aligned with and engaging said keyway when said lever is in said first position and being out of engagement with said keyway but in contact with the periphery of said pin when said lever is in said second position.

4,517,856

POWER TAKE-OFF LEVER ARRANGEMENT FOR A TRACTOR

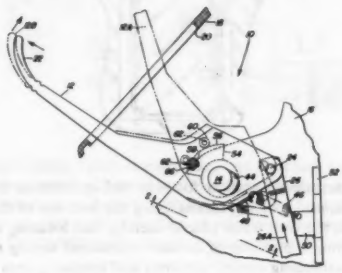
Helmut Schäfer, Ketsch; Volker Hückler, and Michael Teich, both of Mannheim, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Jul. 12, 1982, Ser. No. 397,637

Claims priority, application European Pat. Off., Aug. 3, 1981, 81303548.2

Int. Cl.³ G05G *5/08;* F16B *3/00*

U.S. Cl. 74—528 **9 Claims**



1. A power take-off lever arrangement for a tractor having a manually operable lever connected to a control valve for hydraulically engaging a power take-off drive, said control valve being responsive to move to an engaged position with corresponding movement of said lever and being spring biased to move to a disengaged position with corresponding movement of said lever when hydraulic pressure falls below a predetermined value, said lever arrangement comprising:

(a) a support plate secured to said tractor and having a pin extending outward therefrom, said pin engaging a slot formed in said lever;

(b) an arcuate sector secured to said pin and having a recess formed in an arcuate surface thereof;

(c) a roller attached to said lever which engages in said recess when said lever is in a disengaged position and which rides on said arcuate surface of said sector when said lever is in an engaged position; and

(d) biasing means for urging said roller into said recess when said lever is in said disengaged position and which exerts a limited force on said lever when said lever is in said engaged position, said limited force being insufficient to affect the stability of said lever in said engaged position and being insufficient to affect the movement of said lever to said disengaged position when said hydraulic pressure indirectly acting on said control valve falls below said predetermined value.

4,517,857

GEAR INTERFERENCE PREVENTING MECHANISM IN MULTI-SPINDLE HEAD ATTACHMENT

Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Co., Ltd., Japan

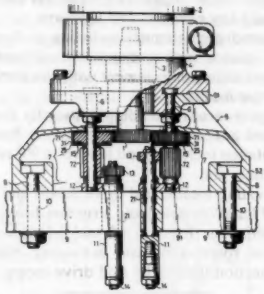
Filed Feb. 16, 1983, Ser. No. 466,779

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 GA **8 Claims**

1. A gear interference preventing mechanism in a multi-spindle head attachment comprising: a main spindle gear adapted to be rotatably driven by a drive source in a drilling machine, tapping machine or the like; a plurality of intermediate gears adjacent to one another and meshed with said main spindle gear; a plurality of adjacent spindles each having a spindle gear meshed with one of said intermediate gears, each of said spindles being rotatably attached to said multi-spindle head attachment through a spindle holder and having its end adapted to

grip a drill or a tap; and at least one gear interference preventing plate located adjacent to and spaced from the teeth of said



gears and said plate being axially aligned with said gear, said plate preventing an interference between said adjacent gears.

4,517,858

DRIVE FOR SINGLE-WORM EXTRUDER

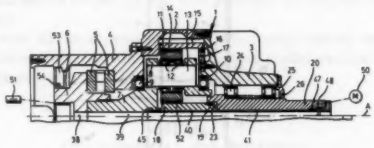
Heinrich Schäfer, Rosdorf, Fed. Rep. of Germany, assignor to Battenfeld Extrusionstechnik GmbH, Bad Oeynhausen, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,666

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3244991

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—801 **10 Claims**



1. A drive for an extruder worm centered on an axis, the drive comprising:

a substantially closed housing axially juxtaposed with the worm;

an input shaft extending along and rotatable in the housing about the axis, exposed axially at an input side of the housing, and adapted to be coupled to a drive motor;

an output shaft rotatable in the housing about the axis, exposed at an input side of the housing, and adapted to be coupled directly to the worm;

an axial-thrust bearing braced between the output shaft and the housing;

a planetary transmission centered on the axis between the input and output shafts in the housing and including:

a sun gear rotationally coupled to the input shaft,

a ring gear spaced radially outward from the sun gear,

a plurality of planet gears meshing with the sun and ring gears, and

a planet carrier carrying the planet gears and rotationally fixed to the output shaft, the shafts, sun gear, and carrier being formed at the axis with coaxial axially throughgoing passages;

a tube having an output end fixed at the passage of the planet carrier and extending along the axis with radial play through the passage of the sun gear and at least partially through the passage of the input shaft and having an input end in the input shaft;

a bearing supporting the input end of the tube in the input-shaft passage; and

a seal between the input end of the tube and the input-shaft passage.

4,517,859

SHIFT UP CLUTCH CONTROL IN A MULTIPLE CLUTCH TYPE GEAR TRANSMISSION FOR AUTOMOBILE

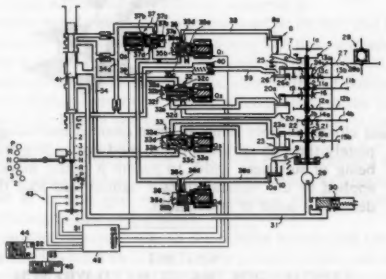
Mitsuru Nagaoka, and Mitsuo Yasuno, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 30, 1982, Ser. No. 454,564

Claims priority, application Japan, Jan. 5, 1982, 57-760; Mar. 29, 1982, 57-50667

Int. Cl.³ B60K *41/18, 41/16;* F16H *5/52*

U.S. Cl. 74—866 **12 Claims**



1. In a multiple clutch type transmission including a plurality of input shafts, a plurality of clutch devices for releasably and alternately connecting respective ones of said input shafts with an engine output shaft, each of said input shafts being associated with at least one set of transmission gears for connecting the input shaft associated therewith to an output element of the transmission, means for controlling said clutch devices so that a selected one of said input shafts is connected through a selected one of said clutch devices with the engine output shaft and through a selected set of said transmission gears with the output element, a method of controlling the clutch devices in a gear shift up operation, which comprises the steps of bringing one of the clutch devices which has not been in engagement into engagement with a first engaging speed for a first period of time while maintaining the other clutch device in engagement, then disconnecting the other clutch device which has been in engagement after a predetermined time so that there is a certain period of overlap wherein the one clutch device is in at least a substantially half-engaged condition while the other clutch device is still in engagement.

4,517,860

PICTURE LOCATING TOOL

James L. Dameron, Jr., 3820 Delashmutt Dr., Haymarket, Va. 22069

Filed Feb. 1, 1984, Ser. No. 575,749

Int. Cl.³ B25B *27/00*

U.S. Cl. 81—487 **2 Claims**

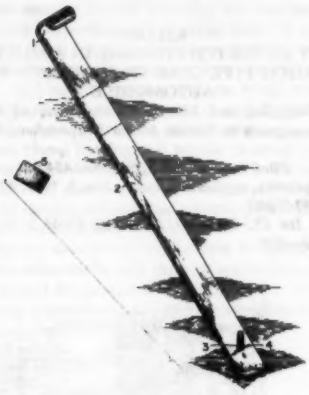
1. A picture locating tool comprising:

a substantially flat body member having a width and a selected length, said substantially flat body member having a first end and a second end with a flange member being provided at said first end and curved toward the second end and being parallel to the width dimension;

an elongated hole located adjacent to said second end of said body member at approximately the center of the width dimension;

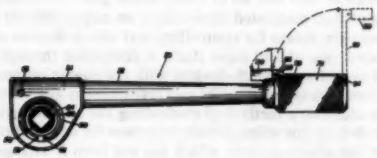
a stud of selected length protruding from an upper end of

said elongated hole which is furthest away from said second end at approximately the center of the width dimension and at an angle directed toward the first end;



said elongated hole being an open channel extending completely through said tool below said protruding stud and being of sufficient width to permit a pencil mark to be applied to the vertical surface behind said tool thereby defining a point of attachment.

4,517,861
CONTINUOUS TRAVEL HAND WRENCH
Ivan Stemberger, 601 DuPont Plz., Miami, Fla. 33131
Filed Jul. 25, 1983, Ser. No. 516,577
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.29 **7 Claims**



1. A wrench assembly of the type primarily designed to be hand operated and substantially continuously driven, said wrench assembly comprising:

(a) a housing having a substantially elongated configuration and a hollow interior portion extending along the length thereof, said housing further including a head portion,

(b) drive means for continuously driving said wrench assembly and including an elongated drive shaft rotatably mounted within said hollow interior portion and including a first gear element mounted at one end thereof adjacent said head portion,

(c) said drive means further comprising a second gear element movably mounted within said housing in meshing driven engagement with said first gear element, whereby rotation of said drive shaft causes rotation of said first and second gear element,

(d) activating means movably mounted on said housing for driving interconnection with said drive shaft,

(e) adaptor means movably mounted on the interior of said second gear element and including a mounting head having a plurality of key elements fixedly formed thereon in spaced relation to one another and each extending outwardly from an outer surface of said mounting head in substantially coplanar relation to one another,

(f) said second gear element comprising a plurality of keyways integrally formed therein, wherein each of said key elements is disposed and dimensioned to fit within one of said keyways,

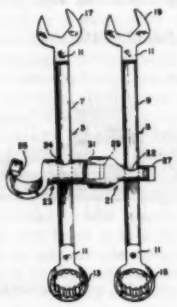
(g) said adaptor means mounted to rotate with said second gear means upon interengagement between respective ones of said key elements and keyways,

(h) said second gear element including at least a partially concave interior surface disposable substantially in supporting and sliding engagement with an exterior surface of said adaptor means,

(i) said adaptor means extending outwardly from said head portion and positionable in a substantially floating manner and orientation including and limited to 90° relative to said head portion, and

(j) said activating means, said drive means and said adaptor means all interconnected and structured to cause substantially continuous rotation of said adaptor means upon continuous rotation of said activating means through interconnection thereof by said drive means.

4,517,862
WHEEL ALIGNMENT TOOL
Moises R. Garcia, deceased, late of Dona Ana, N. Mex. (by Teresa A. Garcia, personal representative), assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 20, 1984, Ser. No. 572,492
Int. Cl.³ B25B *13/02*
U.S. Cl. 81—119 **6 Claims**



1. A special purpose composite hand tool adapted to facilitate fast and accurate adjustment of the front ends and steering mechanisms of motor vehicles, comprising: a pair of shanks, each with an open ended hexagonal wrench at one end and a hexagonal box wrench at the other end, each of said shanks having a slidable member attached thereto, one of said slidable members including on one end thereof a hook adapted to engage a groove of a tie rod adjusting sleeve to facilitate rotation thereof and on the other end thereof a square stud, the other slidable member comprising on one end thereof a screwdriver blade and on the other end thereof a square hole adapted to mate with said square stud.

4,517,863
SUCCESSIVE SCREW FEEDER DRIVER
Shigeru Ishikawa, Tokyo, Japan, assignor to Muro Kinzoku Kogyo Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1983, Ser. No. 559,370
Claims priority, application Japan, Dec. 27, 1982, 57-230489
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—434 **16 Claims**

1. A successive screw feeder driver, comprising in combination;

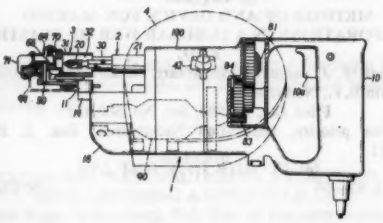
a motor housing accommodating an electric motor in a front

end portion thereof and forming a handle in a base end portion thereof, mounting a transmission mechanism between said electric motor and handle;

a screw chain magazine detachably fixed to said motor housing and holding an elongated screw chain having a large number of screws attached at uniform intervals to a connecting strip by means of a breakable filament;

a screw driving mechanism projected from the front end of said motor housing by a predetermined length in parallel relation with said electric motor for driving said screws;

a feeder block mounting thereof a screw feed mechanism for successively feeding screws on the screw chain from said



magazine one after another to a predetermined driving position in front of said screw driving mechanism, and adapted to hold the screw chain withdrawn from said magazine;

a support member for supporting said feeder block on said motor housing and normally projecting said feeder block from the front end of said motor housing by a predetermined length, said support member being retractable into said motor housing at the time of screw driving operation; and

a screw advance mechanism for advancing screws on said screw chain one after another to said predetermined driving position on said feeder block.

4,517,864

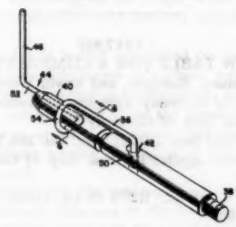
CYLINDRICAL PIN WRENCH

Peter J. Fratta, 11904 Crown Dr., Dunkirk, Md. 20754

Filed Aug. 22, 1983, Ser. No. 525,243

Int. Cl.³ B25B *15/00*

U.S. Cl. 81—436 **11 Claims**



1. In combination, a longitudinally extended cylindrical pin and a wrench adapted for connective mounting to supporting, handling, maneuvering and rotating the pin, said pin having a diametrical wrench engageable hole therethrough, said wrench including a frictionally engageable and operable curvilinear pin engaging recessed portion intermediate the ends of said wrench, said wrench having an end operating handling portion, and a pin hole engaging end disposed at an angle to the axis of said wrench the wrench, when frictionally engaged to and supporting the pin, with the hole operatively interengaged by said pin hole engaging end, being operable for positionally, maneuverably and rotatably moving the pin.

4,517,865

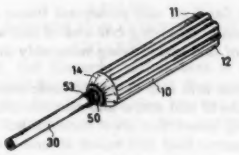
TORQUE-ADJUSTABLE SCREWDRIVER

Yung-Lung Huang, 21-1, Kuo Chung Rd., Ta Li Hsiang, Taichung Hsien, Taiwan (407 R.O.C.)

Filed Jan. 6, 1984, Ser. No. 568,681

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—475 **3 Claims**



1. a torque-adjustable screwdriver comprising:

A tubular handle having two screw holes at its rear end for screws to fix a block serving as a plug and having graduation at its front end as measurements of the torque of its twisting rod and an intermediate internal thread portion;

a block having two screw holes for fixing itself in the rear end of the handle and having circular toothing on its front end;

a twisting rod having a hole in its front end for holding the chisel-like end of the screwdriver and having a projecting part at its rear end which has circular toothing corresponding to that of the block;

an adjusting thimble between the tubular handle and twisting rod having a radial projecting part at its rear end and having a threaded part in front of the projecting part, which keeps in mesh with the internal thread portion of the tubular handle and which makes the twisting rod go back and forth when it is turned by hand on an exposed front part;

a spiral spring fitted over the twisting rod and between the projecting parts of the adjusting thimble and the twisting rod to exert pressure on the twisting rod.

4,517,866

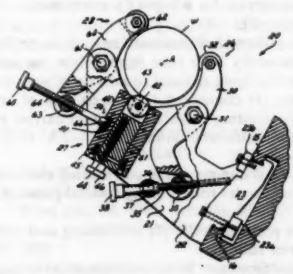
STEADYREST FOR SLANT BED LATHE

Johannes Bazuin, Cincinnati, Ohio, assignor to LeBlond Makino Machine Tool Co., Cincinnati, Ohio

Filed Sep. 7, 1982, Ser. No. 414,963

Int. Cl.³ B23B *25/00;* **B24B** *41/06*

U.S. Cl. 82—39 **6 Claims**



1. A workpiece steadyrest for a metal working apparatus, said steadyrest including:

a steadyrest frame;

a pivot arm;

pivot means for pivotally securing said arm to said frame;

a first workpiece supporting roller mounted on one end of

said pivot arm and movable into a workpiece supporting position;

adjustment screw means for urging said roller against a workpiece, said screw means including a rotatable screw;

means for pivotally and rotationally mounting said screw at another end of said pivot arm for relative movement of said arm end along said screw when said screw is rotated, and for pivotal motion of said screw with respect to said pivot arm;

socket means fixed on said steadyrest frame for releasably and rotationally receiving one end of said screw;

said one end of said screw being releasably disposed in said socket;

said other pivot arm end being movable along said screw upon rotation of said screw and said one end of said pivot arm pivoting about said pivot means when said screw is rotated to move said first roller to and away from said workpiece supporting position; and

said one end of said screw being removable from said socket, upon rotation of said screw, and said pivot arm being freely rotatable about said pivot means without further screw rotation when said screw is removed from said socket, to withdraw said first roller from said workpiece supporting position.

4,517,867

METHOD AND APPARATUS FOR CUTTING A CAST IRON PIPE

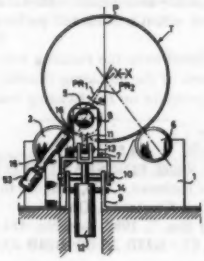
Claude B. Fuminier, Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Pont-A-Mosson, France

Filed Nov. 29, 1983, Ser. No. 556,220

Claims priority, application France, Dec. 10, 1982, 82 20733

Int. Cl.³ B23B *3/04, 5/14;* **B26B** *27/00;* **B26D** *3/16*

U.S. Cl. 82—101 **3 Claims**



1. A cutting device for a tube (T), comprising:

a static frame (1);

two carrier rollers (2, 6) mounted on said frame for supporting horizontally such tube from below, an axis of each carrier roller lying parallel to an axis of such tube;

drive means (3) connected to at least one of said carrier rollers for rotating at least one of said carrier rollers and for rotating such tube on its axis (X—X);

a cutting tool (16);

means on said frame mounting said cutting tool and a driven one of said carrier rollers along a radial plane of such tube and

at least one pressing roller (5) for forcing such tube against said carrier rollers;

means spaced from said frame and connected to said pressing roller for moving said pressing roller radially outwardly into engagement with the interior of such tube and against the wall of such tube;

wherein said moving means comprises a chassis (7) on which said at least one pressing roller is mounted for moving said pressing roller into the interior of such tube and for withdrawing said pressing roller from such tube after completion of cutting; and said moving means places said at least one pressing roller between the two carrier rollers at a small angular distance (α) from one of the driven carrier rollers to which said cutting tool is coupled, said small angular distance being measured between a carrier radial plane (P_{R1}) passing through the axis (X—X) of such tube and through the axis of said one carrier roller and the pressing radial plane (P_{R2}) passing through the axis (X—X) of such tube and through the axis of said pressing roller, said pressing radial plane being located between the vertical axial plane (P) of such tube and the carrier radial plane.

4,517,868

METHOD OF AND DEVICE FOR MAKING PERFORATIONS IN A TUBULAR WEB OF PLASTICS FOIL

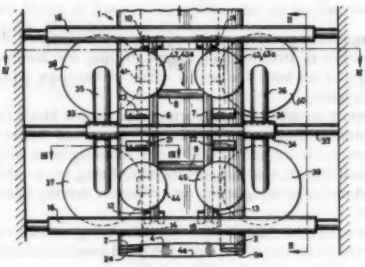
Arnoldus W. J. Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Netherlands

Filed Jun. 2, 1983, Ser. No. 500,422

Claims priority, application Netherlands, Jun. 2, 1982, 8202231

Int. Cl.³ B31B *31/14;* **B26F** *1/06*

U.S. Cl. 83—54 **10 Claims**



1. A method of making perforations in the inner gusset portions of a tubular web of plastics foil which is provided with side gussets having gusset halves comprising the steps of:

opening the gussets over a distance sufficient to introduce, into the interior thereof, a punching member;

inserting a punching member into the interior thereof; and

exerting a pressure from the exterior of the tubular web, so as to activate said punching member.

4,517,869

SAW TABLE FOR A COMPASS SAW

Gerhard Kuhlmann, Stuttgart, and Erwin Wolf, Wei-sach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,751

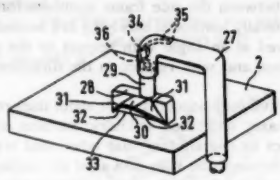
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039459

Int. Cl.³ B27B *19/04, 19/06*

U.S. Cl. 83—100 **11 Claims**

1. A saw table for a compass saw formed particularly as a hand-held power tool, the saw table comprising a table plate having an edge and extending so that a compass saw is located under said table plate and a saw blade extends upwardly beyond said table plate at a predetermined location spaced from said edge, the saw blade being inclinable between a plurality of cutting angles and engageable between a plurality of cutting depths; means forming an air guiding passage; holding means extending from said edge of said table plate to said location and above said table plate, at a distance from the latter at said location; and protecting means for protecting the saw blade, said protecting means being held by said holding means which extends from said edge to said location above said table plate, overlapping the saw blade from a space above said table plate,

being formed as an end piece of said air guiding means, and being arranged movable in direction of the saw blade, said protective means including a protective hood arranged to



surround the saw blade and having an inner dimension corresponding to all cutting angles and depths of the saw blade with a sufficient play.

4,517,870

MACHINE FOR MANUFACTURING A TEMPLATE FOR EDGE GRINDING A SPECTACLE LENS

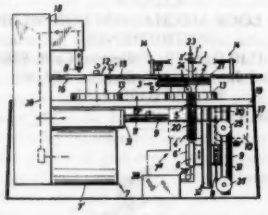
Hubert Kopp, Schramberg, Fed. Rep. of Germany, assignor to Breitfeld & Schliekert GmbH, Bad Vilbel, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 495,018

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218492

Int. Cl.³ B26D *5/00*

U.S. Cl. 83—411 R **1 Claim**



1. A machine for manufacturing a templet for edge grinding a spectacle lens according to the shape of an opening in a spectacle frame designed to hold the lens, which comprises

(a) a housing,

(b) a spectacle frame holder supported on the housing for holding the spectacle frame in a plane, and the opening having an axis extending perpendicularly to the plane,

(c) a copying sensor mounted on the housing for rotation about said axis and for rectilinear displacement in said plane, the sensor sensing the shape of the opening upon rotation thereof,

(d) a blank holder rotatable synchronously with the sensor,

(e) a sliding carriage mounted on the housing for rectilinear displacement with respect to the blank holder, the sliding carriage carrying

(1) a cutting tool for cutting the blank to provide said templet,

(f) a plunger rectilinearly displaceable with the copying sensor and synchronously controlling the rectilinear displacement of the sliding carriage and cutting tool, the plunger having an axis extending in the direction of the axis of the spectacle frame opening,

(g) a sensing element mounted in the housing coaxially with the plunger and spaced therefrom for sensing the distance between the plunger and the sensing element,

(h) mechanical motion transmitting means connecting the sensing element to the sliding carriage,

(i) a drive motor for rectilinearly displacing the sliding carriage, and

(j) an electronic processing unit connected to the drive motor and to the sensing element, the processing unit controlling the rotational speed of the drive motor so that the distance between the plunger and the sensing element remains constant.

4,517,871

CUTTING DEVICE FOR CONTINUOUS RODS OF CIGARETTE

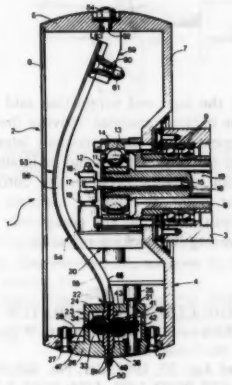
Enzo Seragnoli, and Riccardo Mattei, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Jan. 27, 1983, Ser. No. 461,605

Claims priority, application Italy, Feb. 2, 1982, 47702 A/82

Int. Cl.³ A24C *5/28*

U.S. Cl. 83—677 **7 Claims**



1. A device for cutting continuous rods of cigarette comprising a substantially cylindrical cutting head (2) mounted rotatably about its axis on a support body (3), a drive shaft (10) extending through the support body (3) and connected to rotate the said head (2) by means of a central coupling (12), at least one flexible blade (49) mounted in a substantially radial manner on the said head (2), and advancement means (48) operable to cooperate with the said blade (49) to cause progressive extension thereof from the said head (2), characterised by the fact that the said head (2) further includes within it a magazine (53) for the said blade (39); the said magazine (53) being constituted at least in part by a guide (54) extending across the said head (2) in a substantially diametral direction and around the said central coupling (12).

4,517,872

CONTROLLED DEPTH CUTTING METHOD AND APPARATUS

Helmut Dontscheff, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 30, 1983, Ser. No. 509,662

Int. Cl.³ B65D *3/08*

U.S. Cl. 85—880 **16 Claims**

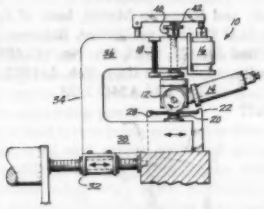
15. In a system in which tape in a tape laying machine is transported by a continuous strip of backing material and in which said machine has cutting means for making lateral cuts through the tape and support means for the tape and backing material, a method of controlling the depth of said cuts to completely sever the tape without impairing the transport of the tape, said method comprising:

fixedly mounting the support means with respect to the cutting means;

positioning the cutting means to maintain an essentially constant distance between the cutting means and a single constant support point on the support means;

moving the tape and the backing material between the cutting means and the support means into position for the tape to be cut by the cutting means;

cutting the tape with the cutting means, and supporting the portion of the tape being cut and the backing material with said support point of the support means;



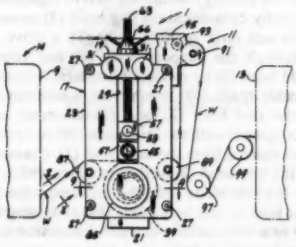
while cutting the tape and supporting said portion of the tape and the backing material, moving the cutting means and the support means simultaneously laterally across the tape and the backing material and maintaining said essentially constant distance between the cutting means and said support point, to thereby maintain an essentially constant depth of the cut and completely sever the tape without severing the backing material.

4,517,873

DIE CUTTING APPARATUS

John S. Wilson, Kirkwood, Mo., assignor to Wilson Manufacturing Company, St. Louis, Mo.

Filed Apr. 25, 1983, Ser. No. 488,583
Int. Cl.[3] B26D *3/08*, *1/56*; B26F *1/42*
U.S. Cl. 83—881 20 Claims



1. Die cutting apparatus for use in a machine for making labels and the like, said machine being of the type wherein a web comprising a layer of pressure sensitive label material on a layer of backing material is fed in a forward direction through the machine, said apparatus being adapted to cut through said layer of pressure sensitive label material as it is fed forwardly without cutting through said backing layer thereby to form individual pressure sensitive labels on the backing layer, said apparatus comprising:

a frame having a pair of side frame members at opposite sides of the frame;

an engraved die roll having a cylindric outer surface with die cutting means thereon extending generally axially with respect to the roll;

means for mounting the die roll on the frame with the roll extending between the side frame members for rotation about a generally horizontal axis lying in a first vertical plane extending generally perpendicular to the direction of web feed;

an anvil roll having a cylindric outer surface; and

means mounting the anvil roll on the frame with the roll extending between the side frame members for rotation about a generally horizontal axis lying in a second vertical plane skewed at an angle with respect to the said first vertical plane and with respect to the direction of web feed;

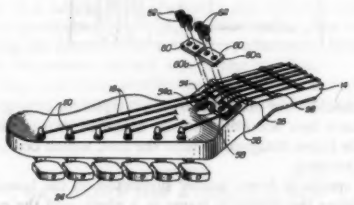
said die and anvil rolls being rotatable about their respective horizontal axes with their cylindric surfaces so spaced with respect to one another that when said web is fed forwardly between the rolls said axial die cutting means on the die roll is adapted for cutting completely through said layer of pressure sensitive label material but not said backing layer to form label edges extending generally transversely with respect to the web, said angle of skew being effective for making the cutting action of said axial die cutting means a progressive slicing cutting action which progresses across the web along a line which, relative to the anvil roll, extends generally axially of the anvil roll from a point on the roll on one side of a line of intersection between the anvil roll and said second vertical plane, over said line of intersection, and thence to a point on the anvil roll on the opposite side of said line of intersection.

4,517,874

STRING LOCK MECHANISM FOR MUSICAL INSTRUMENTS

C. Leo Fender, 1510 Dana Pl., Fullerton, Calif. 92635

Filed Jun. 19, 1984, Ser. No. 622,068
Int. Cl.[3] G10D *3/12*
U.S. Cl. 84—314 N 5 Claims



1. A guitar comprising:

a body;

a neck extending from the body;

a head coupled to the neck, said head and neck having substantially parallel offset planar faces coupled to one another by means of an inclined surface;

a plurality of string posts secured to the head;

a plurality of strings connected to the string posts and extending along the neck over the face thereof to the body;

a nut located at the end of the neck adjacent the head, said nut supporting the strings above the face of the neck; and

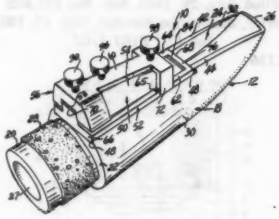
a string clamp secured to said inclined surface for preventing the strings from sliding with respect to the nut, said string clamp including a planar base plate secured to the inclined surface, at least one planar top member positioned over the base plate and at least one fastener for securing the top member to the base plate, wherein the strings pass between the base plate and top member and are clamped thereby.

4,517,875

REED MOUTHPIECE FOR MUSICAL WIND INSTRUMENT

Bruno Dossekker, Zurich, Switzerland, assignor to Sodecom SA, Switzerland

Filed Feb. 28, 1984, Ser. No. 584,537
Int. Cl.³ G10D *9/02*
U.S. Cl. 84—383 R **5 Claims**



1. A mouthpiece for musical wind instrument comprising a casing, a reed and a reed attachment assembly mounted at the top of said casing, said reed attachment assembly comprising a support member pivotably connected to a frame, said frame being fixed to said casing and said frame having a forward stirrup integrally protruding at a right angle proximate an end of said frame, said support member being provided with a plate disposed within said frame, a rearward stirrup integrally protruding at a right angle proximate an end of said plate, a relatively narrow bridge portion integrally protruding from the top of said rearward stirrup proximate the middle thereof, said bridge portion being integrally connected to said forward stirrup protruding from said frame, said attachment assembly further comprising means for adjusting the inclination of said plate of said support member relative to said frame, and means for clamping the foot of said reed to said plate of said pivotable support member such that the blade of said reed protrudes from said attachment assembly and extends over the top of said casing with the tip of said reed being disposed proximate the leading edge of said casing, wherein the distance between said tip of said reed and said leading edge of said casing is variable by said means for adjusting said support plate.

4,517,876

CYMBAL SUPPORT

Dane J. Duhon, 2601 Dusky Rose, Pasadena, Tex. 77502

Filed May 17, 1984, Ser. No. 611,073
Int. Cl.³ G10D *13/06;* **G10G** *5/00*
U.S. Cl. 84—422 R **10 Claims**

1. A cymbal support stand including an upright first tubular member having base means at its lower end for support of said first tubular member from a horizontal surface, a second upright tubular member slidably telescoped in said first tubular member and including an upper end projecting above the upper end of said first tubular member, a lower centrally apertured and upwardly facing cymbal mounted on the upper end of said second tubular member for universal canting relative thereto, an upstanding support rod slidably received through said second tubular member and projecting upwardly through said lower cymbal and above the upper end of said second tubular member, an upper downwardly facing cymbal mounted on the upper end of said rod above and opposing said lower cymbal, means connected between said base means and said rod yieldingly biasing said rod and said upper cymbal toward a static upper position spaced above said lower cymbal, and foot operable means operably connected between said second tubular member and said first tubular member operative to variably stationarily longitudinally position said second tubular member relative to said first tubular member, whereby the vertical spacing between the central areas of said cymbals may be variably adjusted, and foot treadle means operatively connected between said base means and said rod for selectively

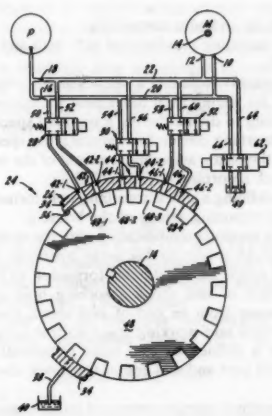
and variably downwardly displacing said rod, and thus said upper cymbal, relative to said lower cymbal.

4,517,877

STEP CONTROL APPARATUS FOR A FLUID MOTOR

Philip J. Mott, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 2, 1983, Ser. No. 463,352
Int. Cl.³ F15B *9/09*
U.S. Cl. 91—48 **6 Claims**



1. Step control apparatus for a fluid motor having first and second motor ports communicating with a source of fluid under pressure, said step control apparatus comprising a control mechanism including a chamber adapted to communicate with a fluid reservoir, three pairs of control ports, each pair having first and second control ports for communicating with said chamber, a control member movable in said chamber, and means for moving said control member in response to movement of said motor, said control member including a plurality of control teeth each of which has an equilibrium position communicating both control ports of a selected pair with said chamber, another position blocking said first control port of

one of the remaining pairs, and yet another position blocking said second control port of the other of the remaining pairs, one of said teeth communicating both control ports of said selected pair with said chamber when in its equilibrium position, and two others of said teeth blocking respectively said first and second control ports of the other two remaining pairs when said one tooth is in its equilibrium position, and said step control apparatus also comprising three valve devices each of which is associated with a pair of said control ports, each valve device being actuatable to communicate said first and second motor ports respectively with said first and second control ports of its associated pair, whereby actuation of said valve devices effects movement of said motor in a stepping mode.

4,517,878
SHOCK ABSORBING DEVICE FOR HYDRAULIC CYLINDER

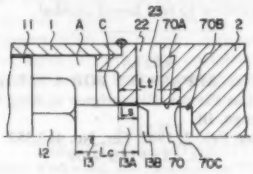
Hisayoshi Hashimoto, and Morio Tamura, both of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 410,954

Claims priority, application Japan, Oct. 20, 1981, 56-155736[U]; Dec. 16, 1981, 56-187841[U]; Mar. 10, 1982, 57-33416[U]

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—396 **6 Claims**



1. A hydraulic cylinder comprising:

a housing including a cylindrical side wall and at least one end wall;

a piston assembly including a piston slidably arranged in said housing for sliding axial movement for cooperating with the housing to define therein a working space;

a shock absorbing device for reducing the speed of movement of the piston assembly at an end of the piston stroke, said shock absorbing device including:

means for defining a shock absorbing hole formed in the end wall and extending axially of the housing,

passageway means communicating with the shock absorbing hole through a port to discharge hydraulic fluid in said working space, said port being formed in an inner peripheral surface of said shock absorbing hole at a position spaced apart from an end of said shock absorbing hole remote from said working space so that a back pressure chamber is defined by said inner peripheral surface between said port and said end of the shock absorbing hole, and

a shock absorbing member mounted on said piston assembly in substantial alignment with said shock absorbing hole and adapted to enter said shock absorbing hole at the end of the piston stroke, said shock absorbing member cooperating with said inner peripheral surface of said hole to define annular gaps of substantially equal areas directly adjacent opposite sides of said port and an orifice between said port and said end of the shock absorbing hole and throttling said port at the extreme end of the piston stroke, said inner peripheral surface of the shock absorbing hole and said shock absorbing member being configured such that the area of said orifice becomes smaller as the piston approaches an end of the stroke whereby the flow rate of the hydraulic fluid discharged from said back pressure chamber through said orifice to said port is increasingly restricted thereby improving the shock absorbing effect prior to a reaching of the end of the stroke.

4,517,879
MACHINE COMPRISING A RECIPROCATING OPERATIVE MEMBER

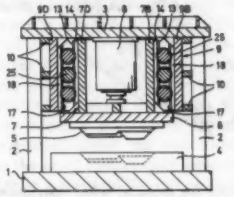
Karl Erik E. Andersson, Kvänum, Sweden, assignor to Verktygsingustri I Blidsberg Aktiebolag, Blidsberg, Sweden

Filed Aug. 29, 1983, Ser. No. 527,475

Claims priority, application Sweden, Sep. 17, 1982, 8205339

Int. Cl.³ F16J *1/02*

U.S. Cl. 92—136 **6 Claims**



1. A machine of the kind comprising an operative member which under direct actuation of driving means is reciprocatable relative to a guide member in a predetermined direction of movement for exerting forces on a workpiece in said direction,

(A) wherein said operative member has

(a) at least one first rack-like toothed surface portion extending in said direction of movement and having teeth extending at an angle to said direction, and

(b) at least one first rollway extending in said direction of movement and having a treadconstituting surface which is co-planar with a pitch plane of said first toothed surface portion;

(B) wherein said guide member has

(c) at least one second rack-like toothed surface portion extending in said direction of movement and having teeth extending at an angle to said direction, and

(d) at least one second rollway extending in said direction of movement and having a treadconstituting surface which is co-planar with a pitch plane of said second toothed surface portion;

(C) wherein said first and second toothed surface portions on said operative member and said guide member, respectively, are opposed to each other, lie in mutually spaced but parallel planes, and have teeth of the same size and pitch;

(D) wherein at least one elongate roller body being entirely separate from said driving means and having an axis of rotation extending at a right angle to said direction of movement is interposed between said operative member and said guide member, said roller body having

(e) at least one circumferentially extending series of teeth meshing with the teeth of said first and second toothed surface portions on said operative member and said guide member, respectively, and

(f) at least one cylindrical body portion which is coaxial with and has the same diameter as a pitch circle of the tooth series of said roller body, said cylindrical body portion being in rolling contact with said first and second rollways on said operative member and said guide member, respectively, for centering said roller body between said opposed first and second toothed surface portions on said two members; and

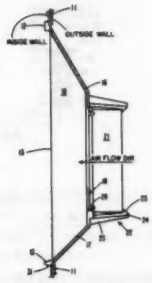
(E) wherein said roller body is free to roll relative to both said operative member and said guide member in said direction of movement, in response to said operative member being actuated, thereby to counteract any tilting tendency of said operative member in a plane which is parallel to said direction of movement and to the axis of rotation of said roller body.

4,517,880

FAN MOUNTING ASSEMBLY

Arthur B. Buckner, West Valley City; Michael L. Davies, American Fork, and Lawrence W. Weber, Bountiful, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,493
Int. Cl.³ F24F *13/00*
U.S. Cl. 98—1 11 Claims



1. An electrical fan mounting assembly for a video display terminal comprising:

a rigid chassis housing in said video display terminal for mounting heat producing components,

an aperture in said rigid housing adapted to permit air flow therethrough,

a flexible moulded plastic panel assembly,

said plastic panel assembly comprising,

a box shaped panel having four sides, at least two sides being substantially parallel vertical sides connected to a front side to form a shallow open box therewith,

an aperture in said front side of said box shaped panel adapted to align with said aperture in said rigid chassis housing,

an axial flow electric fan mounted over said aperture in said front side of said box shaped panel,

tolerance springs formed in the front side of said flexible plastic closure adapted to resiliently support said axial flow electric fan thereon,

a plurality of resilient retainer fingers extended outward from said front side of said panel,

a latch on the end of each said resilient finger adapted to snap over the outside of said electric fan motor and to hold said electric fan in engagement with said tolerance springs,

a plurality of retaining ears extending rearward and outward from the top of said open box shape panel adapted to engage the rear surface of a rigid wall of said chassis housing of said video display terminal at said aperture, and

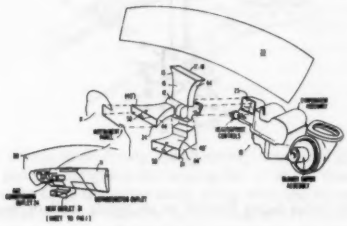
latch means on the bottom side of said open box shape panel extending rearward and outward from the bottom of said open box shape panel and adapted to engage the rear surface of said rigid wall of said chassis housing to rigidly mount said flexible moulded plastic panel on said rigid chassis housing to form a rigid fan mounting assembly therewith.

4,517,881

SWEEPING AIR STREAM APPARATUS AND METHOD

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.

Division of Ser. No. 030,794, Apr. 17, 1979, Pat. No. 4,250,794.
This application Oct. 24, 1980, Ser. No. 200,611
The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.
Int. Cl.³ B60H *1/24*
U.S. Cl. 98—208 5 Claims



3. A method of controlling the distributiion of heating and/or cooling air flowing into the passenger compartment of an automobile from a heating and/or air conditioning supply source and in a direction so as to not impinge upon the windshield of said automobile, comprising:

1. sweeping air from said heating and/or air conditioning supply source at a first sweep rate for an initial period of time, and,

2. subsequently sweeping the air from said heating and/or air conditioning supply source at a different second sweep rate for a further time period,

wherein one of said sweep rates is relatively high is such as to produce a relatively short wavelength such that most of the stream of air resides in the ambient air producing severe mixing of air from said source with the ambient air, and the other of said sweep rates is relatively low to produce a relatively long wavelength in order to reduce mixing of air from said source with ambient air and thereby more rapidly heat up or cool down, respectively, the passenger compartment.

4,517,882

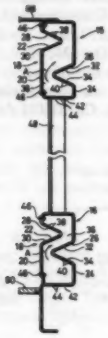
VENTILATING DEVICE FOR A CONTAINER

Masaru Watanabe, Utsunomiya; Toshihide Sakai, Oyama, and Toshio Takase, Utsunomiya, all of Japan, assignors to Fuji Heavy Industries Ltd., Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,075
Claims priority, application Japan, Oct. 18, 1982, 57-157125[U]
Int. Cl.³ B60L *1/20*
U.S. Cl. 98—6 7 Claims

1. A ventilating device for a container, comprising a container frame consisting of tubular rail members, outer ventilation holes formed through an outer wall of said rail member so as to be exposed to the outside of said container, inner ventilation holes formed through an inner wall of said rail member so as to be exposed to the interior of said container, and a ventilation channel defined inside said rail member so as to provide communication between said inner ventilation holes and said outer ventilation holes, characterized in that said ventilating device further comprises a first groove which is formed in an inner side wall of said rail member so as to extend along a longitudinal direction of said rail member, and a second groove which is formed in an outer side wall of said rail member so as to extend substantially parallel to said first groove, a lower

wall of said first groove and an upper wall of said second groove defining a part of said ventilation channel, said inner



ventilation holes being formed in an upper wall of said first groove.

4,517,883

AIR EXTRACT METHOD AND APPARATUS

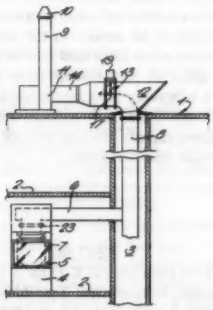
Alec Levchenko, Bolton, and Michael R. Booth, Timperley, both of England, assignors to Febopal Limited, Bolton, England

Filed Feb. 25, 1983, Ser. No. 469,703

Claims priority, application United Kingdom, Apr. 16, 1981, 8112155; Mar. 24, 1982, 8208602; Japan, Apr. 16, 1982, 57-63782

Int. Cl.³ F23J *11/00*

U.S. Cl. 98—115.3 **6 Claims**



1. Air extraction apparatus for extracting air from an enclosure situated solely within a room, said enclosure including an air inlet having a variable opening to provide air only from within said room, and an air outlet including a duct, a suction fan fluidly connected to said duct, and bypass means in said duct fluidly connected to said suction fan, said bypass means communicating with the environment outside said room to supply only atmospheric outside air directly to said fan, said bypass means including adjustable baffle means, said baffle means being pivotable between a first position in which it substantially closes off the suction side of the fan from the enclosure and a second position in which it substantially closes off the suction side of the fan from the outside atmosphere monitoring means for directly monitoring the extent of said variable opening, and control means responsive to said monitoring means for automatically adjusting said baffle means in a manner continuously proportional to the monitored extent of said opening, so that the volume of atmospheric bypass air increases as the volume of air entering the enclosure through said variable opening from said room decreases, and vice versa, such that a predetermined velocity of air is maintained through said variable opening and such that the velocity of air through said suction fan is maintained constant while the volume of air extracted from said enclosure is varied.

4,517,884

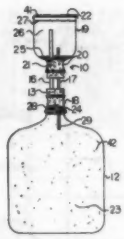
WINE FERMENTATION APPARATUS

Henry C. Jandrich, 369 Duke St., St. Paul, Minn. 55102

Filed Apr. 1, 1983, Ser. No. 481,401

Int. Cl.³ C12G *1/00*

U.S. Cl. 99—276 **18 Claims**



1. A wine fermentation apparatus for use with a fermentation container having a narrow and open top, said apparatus for controlling and aiding a wine fermentation process therein, said apparatus comprising:

(a) a stopper for sealingly engaging the narrowed top of the fermentation container, said stopper having two vertically extending apertures therethrough, said stopper further having a concave, upwardly extending bottom portion for funnelling the upper floating layer produced in the fermentation process,

(b) a pair of conduits of predetermined lengths for the ingress and egress of materials to and from the fermentation container, said conduits for the sealing extension through said apertures of said stopper, the bottom of said egress conduit being flush with said concave bottom portion of said stopper and the bottom of said ingress conduit extending downward from said stopper concave bottom portion, and,

(c) an upwardly extending opened container being in sealing communication with said pair of conduits, said upwardly extending container for receiving materials from the fermentation container through said egress conduit and for holding and returning a makeup fluid to the fermentation container through said ingress conduit, said ingress and egress conduits further having their respective top portions terminate intermediate the top and bottom of said upwardly extending container with said egress conduit terminating at a point higher than that of said ingress conduit, whereby, subsequent to sealingly engaging said apparatus to the top of a fermentation container having a wine fermentation process taking place therein, said apparatus with a makeup fluid therein permits the transfer of the upper floating layer to be funnelled to said concave bottom portion of said stopper through the egress conduit, and the transfer of makeup fluid through the ingress conduit, without disturbing the anaerobic fermentation process in the fermentation container.

4,517,885

WIENER ROASTER

Elmer E. Thompson, Box 662, Sayer, Okla. 73662

Filed Mar. 19, 1984, Ser. No. 591,065

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 HV **8 Claims**

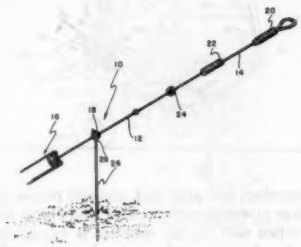
1. A wiener roaster comprising a shank means including a

first section threadably attached to a second section at a threadably securing point;

a tine means integrally bound to said first section;

a bearing collar means rotatably slidably attached to said first section;

a first handle means bound to an end of said second section for gripping the wiener roaster;



a second handle means slidably rotatably positioned about said second section in an area between the threadably securing point of said first section to said second section and the first handle means; and

a stand means to be implanted in a ground and having a structure defining a bifurcated bearing face wherein said bearing collar means removably rotatably lodges as tine means impale wieners and is rotatably situated over a fire, or the like.

4,517,886

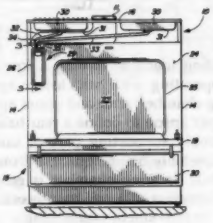
GREASE COLLECTION SYSTEM FOR RANGE

Michael E. Bales, New Palestine, Ind., assignor to The Maytag Company, Newton, Iowa

Filed Jun. 18, 1984, Ser. No. 621,736

Int. Cl.³ A47J *37/10*

U.S. Cl. 99—425 **12 Claims**



1. A grease collection system for a range having grilling capability, comprising: range cabinet means including a generally horizontally disposed top surface and a generally vertically disposed front panel means, said front panel means including an outer door portion and an inner panel portion which defines an oven cavity opening and a secondary opening juxtaposed to said oven cavity opening, said outer door portion being operable to a closed position for covering said oven cavity opening and said secondary opening; means associated with said top surface of said range cabinet means for grilling food products; sump means for catching grease generated during grilling; container means disposed in said secondary opening and having a front wall portion generally flush with the substantially vertical plane of said inner panel portion; and means extending from said sump means to said container means for conducting said grease therebetween.

4,517,887

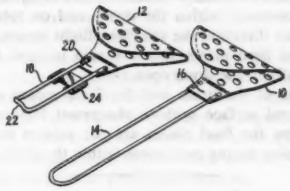
TACO SHELL FRYING MOLD

J. Phillip Childress, 3712 Toll Gate Ter., Falls Church, Va. 22041

Filed Sep. 1, 1983, Ser. No. 528,521

Int. Cl.³ A47J *43/18*

U.S. Cl. 99—426 **20 Claims**



1. In a toco shell frying mold having inner and outer U-shaped pieces configured for nesting the U of the inner mold piece in the U of the outer mold piece with the bases of the mold pieces parallel whereby to sandwich a tortilla for frying into the taco shell therebetween, the improvement comprising:

a first handle projecting from the center portion of a rim formed by one of the upper sides of the U of the outer mold piece; and

connection means slidably connecting the inner mold piece to the first handle for sliding the base of the U of the inner mold piece away from and toward the base of the U of the outer mold piece along a straight line such that the bases remain parallel, whereby to open the mold pieces for receiving the tortilla therebetween and nesting the mold pieces with the tortilla sandwiched therebetween.

4,517,888

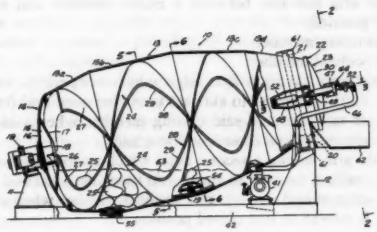
FOOD PROCESSOR

Bruce M. Gould, Fullerton, Calif., assignor to Challenge-Cook Brothers, Inc., City of Industry, Calif.

Continuation of Ser. No. 196,876, Oct. 14, 1980, abandoned. This application May 2, 1984, Ser. No. 605,990

Int. Cl.³ A23B *4/02*; B01F *13/06*

U.S. Cl. 99—472 **51 Claims**



1. Apparatus for kneading a multiplicity of substantially integral food pieces, comprising:

(a) a rotatable drum having a sidewall, a closed end to the drum, and an open end for feeding the food pieces into the drum and discharging the food pieces from the drum, the open end being opposite the closed end;

(b) a mounting means for the drum to permit drum rotation about a longitudinal axis extending between the ends at an incline to the horizontal;

(c) means adapted for drivingly engaging the drum thereby to permit drum rotation; and

(d) spiralling flight means mounted on the inside of the sidewall of the drum and extending over substantially the length between the closed end and the open end of the drum, said spiralling flight means projecting inwardly from the sidewall for causing the integral food pieces to be

continuously forced to move longitudinally within the drum from end to end in both directions and relative to the other integral food pieces by the movement of the spiralling flight means through the multiplicity of food pieces during rotation in the direction wherein the spiralling flight means progresses from the open end toward the closed end and whereby the integral food pieces are kneaded by contact with each other during said longitudinal movement within the drum, and on rotation in the opposite direction the spiralling flight means acts on the integral food pieces to move said integral food pieces generally to the drum open end;

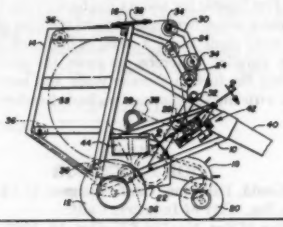
the inside of the drum and the flight means providing a structural surface without sharpened features or edges whereby the food pieces are not subject to substantial separation during movement within the drum.

4,517,889

TWINE CUTTING AND CLAMPING APPARATUS FOR A ROLL BALING MACHINE

James D. Walker, Lancaster; Kenneth R. Underhill, Strasburg, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 16, 1984, Ser. No. 600,750
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 **5 Claims**



1. In a roll baling machine having means for wrapping a roll bale with twine, apparatus for cutting and clamping said twine, said apparatus comprising:

an arm movable between a closed position and an open position;

a cutting member;

a resilient member;

said arm having a first edge which cooperates with said cutting member to cut said twine between said first edge of said arm and said cutting member when said arm is moved to said closed position; and

said arm having a second edge which cooperates with said resilient member to clamp said twine between said second edge of said arm and said resilient member when said arm is moved to said closed position.

4,517,890

TWINE WRAPPING APPARATUS FOR A ROLL BALING MACHINE

Willis R. Campbell, Ephrata, and James D. Walker, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

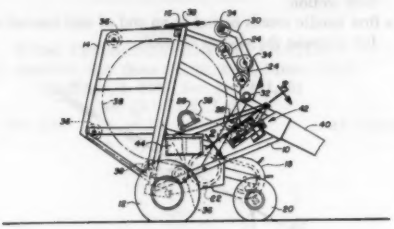
Filed Apr. 16, 1984, Ser. No. 600,872
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 **16 Claims**

1. In a roll baling machine having a base frame with a pair of side walls arranged to define a space therebetween, an apparatus for wrapping a roll bale with twine, said apparatus comprising:

a shuttle member movable generally transversely of said base frame in the space defined between said side walls;

a twine dispensing member pivotably mounted on said base frame; and

a gear rack carried on said shuttle member in intermeshing engagement with a pinion connected to said twine dispensing member, said gear rack and said pinion cooperating to cause pivoting movement of said twine dispensing member when said shuttle member is moved generally transversely of said base frame in the space defined between said side walls.

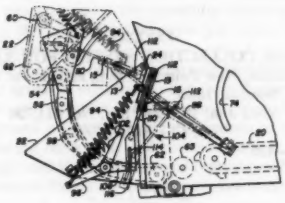


4,517,891

CONTROL LINKAGE FOR CONTINUOUS ROLL BALING MACHINE

James W. Henry, Yorkton, Canada, assignor to Sperry Corporation, New Holland, Pa.

Filed Nov. 29, 1983, Ser. No. 556,230
Int. Cl.³ B30B *5/06*; A01D *39/00*
U.S. Cl. 100—88 **3 Claims**



1. In a roll baling machine having a lower apron, a first upper apron cooperating with said lower apron to define a front bale forming chamber, a second upper apron cooperating with said first upper apron to define a rear bale forming chamber, an arm assembly supporting part of said second upper apron, said arm assembly being rotatable from a first position when said rear bale forming chamber is empty to a second position during formation of a roll bale in said rear bale forming chamber, the improvement comprising:

control means for holding said arm assembly in said second position while a roll bale is being discharged from said rear bale forming chamber, and said control means including a link member having a lost-motion connection with said arm assembly as said arm assembly moves between said first and second positions.

4,517,892

UNIVERSAL CAN CRUSHER

Donald D. Meisner, 2420 S. M St., Oxnard, Calif. 93033

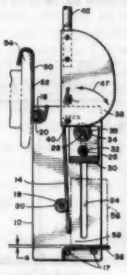
Filed Nov. 30, 1981, Ser. No. 325,723
Int. Cl.³ B30B *9/32*
U.S. Cl. 100—292 **13 Claims**

1. A can crushing device comprising:

fixed abutment means;

movable abutment means mounted in opposing relationship to said fixed abutment means;

said movable abutment means comprising:
movable carriage means;
planar means mounted on said carriage means for movement therewith;
said planar means being formed to have a dihedral angle;



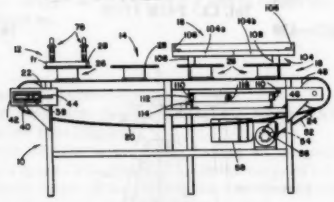
movable means for moving said movable abutment means toward or away from said fixed abutment means;
said movable means adapted to apply a variable force to said movable abutment means during its movement toward said fixed abutment means.

4,517,893

SILK SCREEN PRINTING WITH THE CURING OF POLYMERIZABLE LIQUIDS

George J. Wile, Indian Hill, and Carl P. Griesdorn, Cincinnati, both of Ohio, assignors to Planet Products Corporation, Cincinnati, Ohio

Continuation of Ser. No. 402,616, Jul. 28, 1982, abandoned. This application May 7, 1984, Ser. No. 607,979
Int. Cl.³ B41L *13/02*
U.S. Cl. 101—123 **18 Claims**



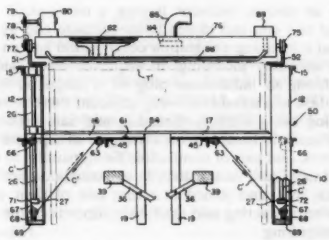
1. Apparatus for the production of silk screened textile goods comprising:
a printing station at which silk screen designs are printed on successive workpieces,
a "drying" station at which the printed designs are "dried",
a conveyor for supporting the workpieces and having a run extending from the printing station to the "drying" station,
means for incrementally advancing said conveyor with a minimum dwell period between each incremental advancement, whereby the workpieces may be positioned at the printing station and a design printed thereon while the conveyor is at rest and then advanced to the drying station for a minimum residence time thereat,
the "drying" station comprising a heater element having means for generating and directing infra-red radiation in the spectrally limited range of three to four microns wave length toward the workpieces positioned on the conveyor,
the printing station comprising means for holding a silk screen frame, said holding means being displacable from an operative position wherein the silk screen frame overlays a workpiece positioned on the conveyor for the printing of a design thereon, and an inoperative position in which the silk screen frame is spaced from the conveyer,
means responsive to displacement of the holding means to its inoperative position for actuating the incremental advancing means for the conveyer, and
means for terminating exposure of the workpieces to radiation from said heater element upon expiration of a predetermined maximum time for actuation of the means for incrementally advancing the conveyer,
the heater element being mounted above the conveyer and spaced from the workpieces thereof and being displacable from an operative position in which its radiant energy is directed towards the conveyer and an inoperative position laterally of the conveyor wherein no more than a minimal portion of such radiation is directed towards the conveyer and the workpieces positioned thereon,
the means for terminating exposure of the workpieces to radiation including means for displacing the heater element from its operative to its inoperative position.

4,517,894

MODULAR SCREEN PRINTING APPARATUS

James R. Davis, 61 W. Jefferson Rd., Pittsford, N.Y. 14534, and John C. Hoffend, 6029 Logan Rd., Mount Morris, N.Y. 14510

Filed Jul. 21, 1983, Ser. No. 515,667
Int. Cl.³ B85C *17/06*
U.S. Cl. 101—126 **14 Claims**



1. A manually operable screen printing machine made by connecting together a plurality of modular screen printing frames, and comprising
a pair of like, modular screen printing frames having front ends and rear ends, respectively,
means for releasably securing said pair of frames together with the front ends thereof disposed is spaced, confronting relation,
a pair of like, laterally spaced screen supports mounted for vertical reciprocation on said frames adjacent the rear ends thereof,
a printing screen removably secured along the opposed side edges thereof to said supports and extending horizontally between said supports,
a counterweight mounted on each of said frames for offsetting the weights of said supports and said screen,
means for suspending each of said counterweights on its respective frame for vertical movement beneath said screen, and operatively connecting each of said counterweights to its associated screen support normally to hold the last-named support releasably in its upper limit position on its associated frame, and
means interconnecting said supports for vertical movement manually and in unison between their upper and lower limit positions, thereby to move said horizontally disposed screen between elevated and lowered positions, respectively.

4,517,895

ELECTRIC INITIATOR RESISTANT TO ACTUATION BY RADIO FREQUENCY AND ELECTROSTATIC ENERGIES

Klaus G. Rucker, Kinnelon, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 15, 1982, Ser. No. 441,755
Int. Cl.³ F42B *3/18*
U.S. Cl. 102—202.2 **11 Claims**

1. In an electric initiator having a metal shell integrally closed at one end and closed at its opposite end by a sealing plug, and containing an ignition composition and an electrical ignition assembly including, in sequence from said ignition composition, an inductance plug of a magnetic inductance composition and a resistance slug adjacent thereto, said inductance plug being slidably threaded, and said resistance slug being adherently threaded, on a first pair of separate electrical conductors, said pair of conductors being parallel to the longitudinal axis of said metal shell, in electrical contact with said resistance slug, and joined at a first one of their ends by a bridgewire contacting said ignition composition, the improvement comprising

(a) an entrance inductance plug of a magnetic inductance composition adjacent said sealing plug; and

(b) a pair of separate resistors between, and adjacent, said entrance inductance plug and said resistance slug, each of said resistors having (1), seated in the end thereof adjacent said resistance slug, the second end of one of said first pair of electrical conductors and (2), seated in the end thereof adjacent said entrance inductance plug, a first end of one of a second pair of separate electrical conductors, said second pair of conductors being parallel to the longitudinal axis of said metal shell, having said entrance inductance plug slidably threaded thereon, and each having a second end joined to a leg wire.

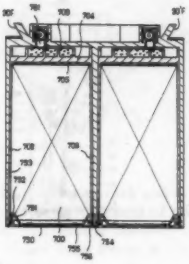
4,517,896

ELECTROMAGNETIC DECOY LAUNCHING DEVICE, IN PARTICULAR FOR AN AIRCRAFT

Alain A. Billard, Muret, and André R. Santalucia, Leguevin, both of France, assignors to Etienne LaCroix - Tous Artifices, Muret, France

Filed Jun. 1, 1982, Ser. No. 383,772
Claims priority, application France, Jun. 3, 1981, 81 10977
Int. Cl.³ F42B *13/50*; F41F *5/02*
U.S. Cl. 102—342 **9 Claims**

1. An electromagnetic decoy launching device, of the type comprising an ejection cavity with an ejection opening at one side, a decoy support member housed in the ejection cavity for ejection from the cavity in a direction extending through the ejection opening, and provided with a low pyrotechnic ejection charge and means connected with the cavity for igniting the ejecting charge on command, the decoy support member and the ejection cavity being of rectangular cross-section, the decoys being housed in the cavity crosswise to the ejection direction, and a retaining member between the decoy support member and ejection cavity with releasable V-shaped clips pointed toward the inside surface of the cavity and establishing



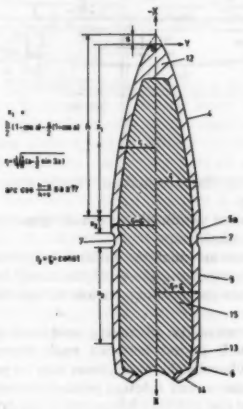
with the cavity a gripping engagement, the V-shaped clips themselves being released from engagement with the cavity by translational movement of the support member toward the ejection opening by the pyrotechnic ejection charge in order to allow a slow departure of the decoy support member, whilst also ensuring, before ejection of the decoys, resistance to vibratory stresses such as those existing on board an aircraft.

4,517,897

SMALL ARMS PROJECTILE

Beat Kneubühl, Oberdiessbach, Switzerland, assignor to Schweizerische Eidgenossenschaft, Vertreten Durch Die Eidg. Munitionsfabrik Thun Der Gruppe Für Rüstungsdienste, Thun, Switzerland

Filed Oct. 18, 1982, Ser. No. 434,911
Int. Cl.³ F42B *11/08*
U.S. Cl. 102—439 **14 Claims**



1. Small arms ammunition comprising:

a cartridge case containing a powder charge and having an open end, a closed end and a longitudinal axis;

a percussion cap substantially centered at said closed end with respect to the longitudinal axis of said cartridge case;

a rotationally symmetric jacket bullet enclosing a metallic core located at said open end;

said jacket bullet having opposed tip and rear ends, intermediate thereof an attachment section for attachment with said cartridge case and a radius r;

said jacket bullet having a shape which is aerodynamically optimized in respect of drag and other than at said rear end and said attachment section having a profile which extends from said tip end of said jacket bullet at the origin of a rectangular coordinate system, in which the x-axis represents a jacket bullet axis of symmetry and the y-axis represents a direction of said radius r of the jacket bullet, and which is substantially determined by a continuous function r(x), according to which the value of the radius r continuously increases from a predetermined value at said tip end of the jacket to a maximum value r_0 of the radius r and which has a continuous differential quotient (dr/dx) which has a finite positive value at said predetermined value of the radius r at said tip end of the jacket bullet and which decreases to a value of zero at the maximum value r_0 of the radius r;

the profile of the jacket bullet being determined, with the exception of the rear end and the attachment section for the cartridge case, by a sum function

$$r(x)=r_1(x_1)+r_2(x_2)$$

in which the range of x_1 is defined in the range from $x=0$ to $x=h$ by

$$x_1=(h/2)(1-\cos a)-(s/2)(1+\cos a),$$

h representing an imaginary length of said bullet from x_1 as determined by $a=\pi$ to an imaginary tip of said bullet and arc $\cos((h-s)/(h+s))\leqq a\leqq\pi$, while the associated values of r_1 are given by

$$r_1 = r_0\sqrt{\frac{1}{\pi}\left(a-\frac{1}{2}\sin 2a\right)},$$

wherein arc $\cos((h-s)/(h+s))\leqq a\leqq\pi$ and in which the range of x_2 is defined by

$$x>h,$$

in which range $r_2=\text{constant}=r_0$;

wherein, in said sum function $r_1(x_1)=0$ when $x>h$ and $r_2(x_2)=0$ when $0\leqq x\leqq h$; and

said profile of said jacket bullet having an imaginary tip which is spaced by a distance $-s$ in the range of 0.1 to 0.5 r_0 from the origin of the rectangular coordinate system, at which said tip end of said bullet is located.

4,517,898

HIGHLY ACCURATE PROJECTILE FOR USE WITH SMALL ARMS

Dale M. Davis, Rte. 2, Box #130, and John C. Robbins, Rte. 2, Box #62, both of Freeport, Fla. 32439

Continuation-in-part of Ser. No. 103,644, Dec. 14, 1979, abandoned. This application Sep. 17, 1982, Ser. No. 419,253

Int. Cl.³ F42B *11/08*

U.S. Cl. 102—514 **5 Claims**

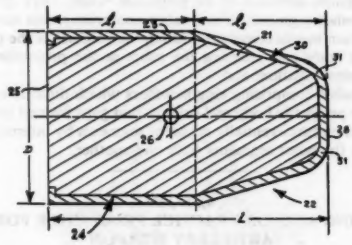
1. A highly accurate metal jacketed projectile for use with small arms, said projectile having a specific configuration comprising:

a cylindrically-shaped body portion having a predetermined length and a predetermined diameter, a forward end and a completely flat rear end;

a nose portion formed adjacent said forward end of said body portion, said nose portion being substantially in the shape of a truncated cone terminating in a completely flat front surface;

said body portion and said nose portion including a completely solid core encapsulated by a metal jacket, and said metal jacket having a completely smooth outer surface; and

said projectile having an overall predetermined length, said predetermined length of said cylindrically-shaped body portion being equal to approximately 55% of said overall predetermined length of said projectile and also equal to approximately 85% of said diameter of said body portion,



and said overall predetermined length of said projectile being equal to approximately 1.55 times said predetermined diameter of said body portion;

wherein said specific configuration of said projectile provides that the center of gravity of said projectile be located within said body portion and the center of pressure of said projectile be located substantially forward of said center of gravity of said projectile.

4,517,899

SABOT PROJECTILE

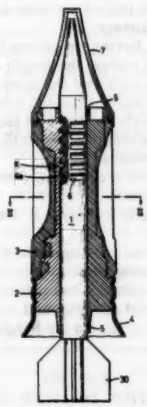
Peter Häberli, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 250,944, Apr. 6, 1981, abandoned, which is a division of Ser. No. 060,050, Jul. 23, 1979, Pat. No. 4,351,094. This application Sep. 20, 1982, Ser. No. 420,360

Claims priority, application Switzerland, Aug. 8, 1978, 8404/78

Int. Cl.³ F42B *13/16*

U.S. Cl. 102—521 **14 Claims**



1. A sabot projectile comprising:

a projectile body;

a sabot composed of a number of segments formed of a metal alloy and secured at the projectile body;

said segments circumferentially enclosing part of said pro-

jectile body with gaps formed between circumferentially adjacent ones of said segments;
a plastic jacket surrounding the sabot segments and protruding into said gaps;
said projectile body being provided with a plurality of recesses;
each said recess of said projectile body possessing lateral boundary surfaces which delimit said recess in the circumferential direction of the projectile body;
said sabot segments of said sabot comprising cam means;
said cam means completely filling the recesses at the projectile body and securing the sabot at the projectile body against rotation; and
said sabot comprising ring members which directly enclose the projectile body and bridges said gaps formed between said circumferentially adjacent segments by interconnecting the sabot segments with one another.

4,517,900

TESTING AND/OR PRACTICE PROJECTILE FOR AN ARTILLERY WEAPON

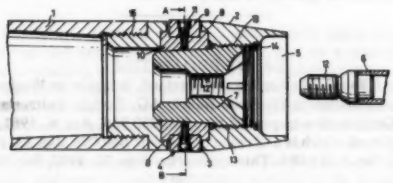
Herbert Lipp, Düsseldorf, and Horst Reckeweg, Heiligenhaus, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,778

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225984

Int. Cl.³ F42B *9/20*

U.S. Cl. 102—529 **5 Claims**



1. Testing and/or practice projectile assembly for preselected use in an artillery weapon in lieu of a preselected conventional live projectile, comprising in combination,
a casing having a rear portion and having an axial length which is less than that of the conventional projectile by a predetermined distance;
an insert member having an internal bore is operatively mounted on said casing, the length and diameter of said insert member is such that the exterior contour and total length of the projectile assembly when the insert member has been operatively mounted on said casing corresponds to that of the conventional projectile; said insert member has at least one annular recess;
a guide band segment is operatively mounted in each recess of said insert member;
a biasing cone axially mounted in the bore of said insert member;
and a pull rod adapted to be operatively coaxially connected to said biasing cone so as to selectively bias said guide band member outwardly to conform to a predetermined exterior guide band diameter and to retractably release it so as to selectively release the band segments.

4,517,901

TRANSACTION DRAWER ASSEMBLY

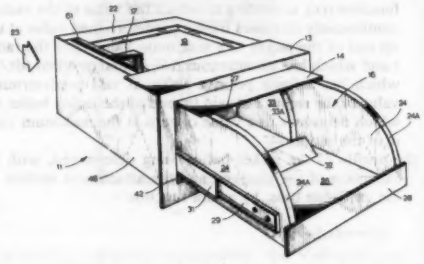
Larry G. Clark, 5532 Hollister Dr., Indianapolis, Ind. 46224

Filed Jun. 15, 1983, Ser. No. 504,535

Int. Cl.³ E05G *7/00*

U.S. Cl. 109—19 **17 Claims**

1. A through-a-wall transaction assembly comprising:
a housing having outer and inner ends;
a drawer having an open top and having a front end adjacent the outer end of the housing, said drawer being movably mounted in said housing for movement between a first position wherein the drawer is in the housing and a second position wherein the front of the drawer is projected beyond the outer end of the housing;
a drawer cover pivotally mounted in position over the drawer and having an access-accommodating position exposing at least a portion of the top and interior of said drawer to an area behind the outer end of the housing



when said drawer is in said first position, and said cover being supported in an access-exclusionary position when said drawer is in said second position;
first cam means on said drawer and operable to move said cover from said access-accommodating position to said access-exclusionary position as said drawer is moved from said first position to said second position; and
said cam means including curved shoulders at the side walls of the drawer.

4,517,902

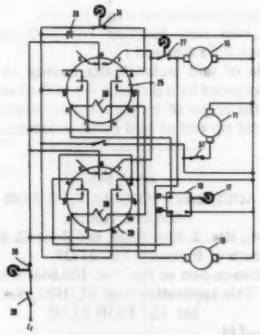
CONTROL CIRCUIT FOR A SOLID FUEL FURNACE

J. Vernon Christian, 2160 Longreen Rd., Kingsport, Tenn. 37660

Filed May 31, 1983, Ser. No. 499,468

Int. Cl.³ F23N *5/02*

U.S. Cl. 110—190 **9 Claims**



1. A control circuit for a solid fuel, warm air furnace which includes a combustion chamber, means for delivering solid fuel to the combustion chamber, means for delivering combustion air to the combustion chamber, and means for delivering air heated by heat from combustion of said fuel from said furnace to a comfort zone; the control circuit comprising first circuit means including first thermo-sensitive means operable in response to a temperature sensed by the first thermo-sensitive means below a first preselected temperature to energize the fuel delivery means and the combustion air delivery means, second circuit means including a second thermo-sensitive

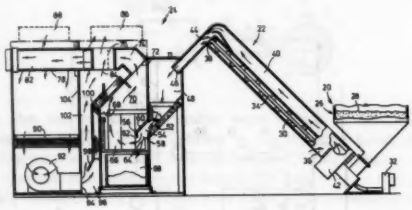
means and operable in response to a temperature related to furnace performance above a second preselected temperature to energize said heated air delivery means and to interrupt the first circuit means while maintaining the combustion air delivery means energized, said second thermo-sensitive means being operable to interrupt the second circuit means in response to furnace performance related temperatures below said second preselected temperature, said first circuit means being operable to re-energize the fuel delivery means and the combustion air delivery means upon interruption of said second circuit means if the temperature sensed by said first thermo-sensitive means remains below said first preselected temperature.

4,517,903

SOLID FUEL FURNACE

Iain J. Richmond; David Wong, both of Orillia; Ants Puust, Scarborough, and James A. Oldham, Bolton, all of Canada, assignors to Hunter Enterprises Orillia Limited, Orillia, Canada

Filed Jun. 1, 1983, Ser. No. 499,949
Int. Cl.³ F25B *7/00*
U.S. Cl. 110—233 **16 Claims**



1. A solid fuel furnace for heating a recirculating heat medium and comprising:

a combustion chamber having an inlet and an outlet, fuel support means located between the inlet and the outlet for supporting a supply of particulate fuel for combustion thereof, the combustion chamber inlet being located above the support means for receiving a supply of fuel and a supply of air to be delivered to the fuel support means from fuel delivery means and air supply means respectively, the combustion chamber being defined in part by walls which converge downwardly from the inlet towards the fuel support means, said convergement walls constituting means effective to throttle said air supply as it passs through or over said fuel,

a combustion products suppension and separation chamber for separating heated combustion gases from combustion products, and for retaining said combustion products in suspension sufficiently long to permit continued combustion thereof, the combustion products suspension and separation chamber having an inlet connected to the outlet of the combustion chamber and an outlet for permitting the passage of heated combustion gases and incompletely combusted products therethrough;

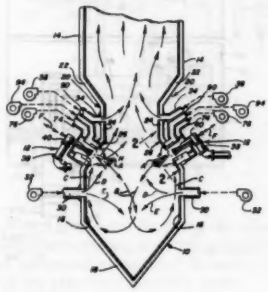
heat exchange means having an inlet for receiving the heated combustion gases from the outlet of the combustion products and separation chamber, and said heat exchange means transferring heat from the combustion gases to the recirculating heat medium, the heat exchange means having an outlet for venting said combustion gases to atmosphere after transferring heat to the recirculating heat medium.

4,517,904

FURNACE, BURNER AND METHOD FOR BURNING PULVERIZED COAL

Craig A. Penterson, Sutton, and Donald S. Langille, Worcester, both of Mass., assignors to Riley Stoker Corporation, Worcester, Mass.

Filed Feb. 28, 1984, Ser. No. 584,484
Int. Cl.³ F23D *1/02*
U.S. Cl. 110—264 **19 Claims**



1. A burner for pulverized coal comprising:

tubular nozzle means having an inlet for receiving a primary flowing stream of coal and air mixture and an outlet end for discharging said stream into a combustion zone of a furnace for burning;

annular, venturi-like flow control means in said nozzle means coaxially disposed adjacent said outlet end, said flow control means having a divergent flow section with a maximum diameter outlet adjacent said outlet end of said nozzle means and a convergent flow section upstream thereof for more evenly distributing said pulverized coal in the center portion of said stream;

coal spreader means mounted in coaxial alignment in said divergent flow section having an end adjacent said outlet end and a wall surface cooperating with wall surfaces of said divergent flow section to form a diverging, frusto-conical annular-shaped flow passage;

swirl vane flow divider means positioned in said passage between said coal spreader means and surfaces of said divergent flow section for dividing said homogenous mixture of coal and air in a swirling action into distinct streams of fuel rich and fuel lean zones for discharge into said combustion zone;

a tubular conduit in coaxial alignment with said tubular nozzle means having an inlet for secondary air and an outlet adjacent said outlet end of said tubular nozzle means for discharging an annular flow of secondary air into said combustion zone around said streams of said coal and air mixture discharged into said combustion zone;

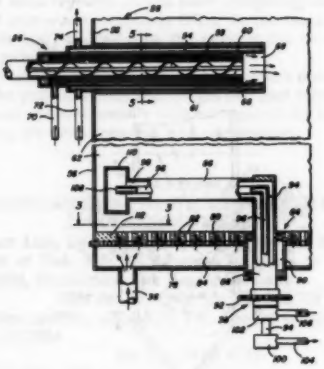
a plurality of tertiary air conduits spaced radially outwardly of said tubular conduit, each having an outlet port for discharging a stream of tertiary air into said combustion zone; and

vane means in each of said tertiary air conduits movable to direct a stream of tertiary air into or away from the primary coal and air mixture discharging into said combustion zone for NO_x control and combustion performance.

4,517,905
PARTICULATE WASTE PRODUCT COMBUSTION SYSTEM

Charles E. Chastain, and Donald R. King, both of Stuttgart, Ark., assignors to PRM Energy Systems, Inc., Stuttgart, Ark.

Filed Feb. 10, 1983, Ser. No. 465,648
Int. Cl.³ F23G 5/00, 7/00
U.S. Cl. 110—346 15 Claims



1. A method of incinerating particulate solids by combustion above a horizontal bed within a combustion chamber to produce a useful exhaust heat medium having a minimal fly ash content and an ash residue product, including the steps of: mechanically fluidizing the solids within a particle fluidizing zone above said bed within the combustion chamber; physically displacing the particulate solids radially outward of the fluidizing zone during the mechanical fluidization thereof while undergoing combustion; receiving the ash residue product within a collection zone on the bed radially outward of the fluidizing zone; and conducting the exhaust heat medium from the fluidizing zone through the combustion chamber, said particulate solids being introduced at a substantially uniform weight feed rate, fluidization of the solids within said fluidizing zone being enhanced by an underfire inflow of air conducted through the bed at a flow rate between 600 and 2300 cubic feet per minute.

4,517,906
METHOD AND APPARATUS FOR CONTROLLING AUXILIARY FUEL ADDITION TO A PYROLYSIS FURNACE

Frederick M. Lewis, Mountain View, Calif., and George A. Berken, Kronenwetter, Wis., assignors to Zimpro Inc., Rothschild, Wis.

Filed Aug. 30, 1983, Ser. No. 528,271
Int. Cl.³ F23G 15/00
U.S. Cl. 110—346 2 Claims

1. In a method for controlling the operation of a two stage furnace to efficiently incinerate combustible material in a starved-air mode, a primary stage having means to introduce combustible material therein as well as auxiliary fuel burner(s) and combustion air flow means for introducing flows of auxiliary fuel-air mixture and combustion air, respectively, into said primary stage at substoichiometric air conditions to pyrolyze the combustible material at predetermined set point(s) and a secondary stage connected to said primary stage to receive gas and vapor products from said primary stage, said secondary stage including secondary combustion airflow means for introducing a flow of secondary combustion air and being operated at excess air conditions at a predetermined minimum temperature to combust said gas and vapor products from the primary stage, and wherein the combusted gas and vapor products are discharged as flue gas from the secondary stage, the improvement which comprises the steps of:

(a) measuring the oxygen concentration in the flue gas discharged from said secondary stage:

(b) measuring the air flow rates to each of the primary and secondary stages of said furnace, and using said measured rates and said measured oxygen concentration to compute the primary stage air rate as a percentage or fractional value of the stoichiometric air rate;

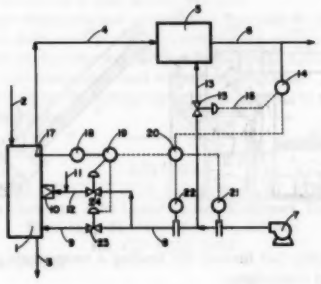
(c) establishing a predetermined set-point control value of said primary stage percent stoichiometric air to achieve the desired efficient furnace operation;

(d) comparing said computed percent stoichiometric air value from step (b) with said predetermined set-point control value of primary stage percent stoichiometric air;

(e) establishing a predetermined set-point control value of primary stage temperature;

(f) measuring said primary stage temperature and comparing said primary stage temperature with said predetermined set-point control value of primary stage temperature;

(g) controlling said flows of auxiliary fuel-air mixture to said burner(s) and air to said combustion air flow means to simultaneously maintain said primary stage temperature at its predetermined set-point control value and said primary stage percent stoichiometric air at its predetermined set-point control value, said control of primary stage comprising:



(x) correcting variations in primary stage temperature to the predetermined temperature set-point value by regulating changes in flow rate of said auxiliary fuel-air mixture at a pre-set finite minimal relay function and regulating changes in said combustion air flow rate at a pre-set finite maximum relay function, provided computed primary stage percent stoichiometric air is below said predetermined set-point control value of percent stoichiometric air in the primary stage;

(xx) regulating changes in flow rates of said fuel-air mixture and said combustion air when said computed primary stage percent stoichiometric air is at the predetermined set point value wherein as the heat required to maintain said predetermined set-point temperature increases, the relay function for regulating said fuel-air mixture is continuously modulated from said pre-set minimum value to a pre-set finite maximum value, and the relay function for regulating said combustion air rate is continuously modulated from said pre-set maximum value to a pre-set finite minimum value, the resulting said changes in flow rates acting to satisfy said heat requirement without changing said computed primary stage percent stoichiometric air; and

(xxx) correcting variations in the temperature in said primary stage to the predetermined set-point value, when said computed primary stage percent stoichiometric air exceeds the predetermined set point control value wherein said relay function for regulating said

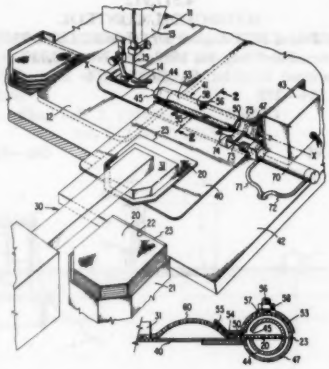
fuel-air mixture is maintained at pre-set maximum value, and said relay function for regulating said combustion air mixture is maintained at said pre-set minimum value.

4,517,907

DRIVEN WORK FOLDER

John M. Franke, Sr., Glendale, Calif., assignor to The Singer Company, Stamford, Conn.

Filed May 17, 1984, Ser. No. 611,240
Int. Cl.³ D05B *21/00, 35/02*
U.S. Cl. 112—121.15 **10 Claims**



1. An automatically operable work fabric manipulating device for folding and delivering to the stitching point of a sewing machine one edge of a fabric panel, comprising:

a mandrel rotatable about a lengthwise axis;

said mandrel being formed with a fabric accommodating slot extending parallel to the lengthwise axis thereof, and having a mouth opening at one side of said mandrel;

drive means for rotating said mandrel to form a fold in a fabric panel edge inserted in said mandrel slot, said drive means operatively connected to said mandrel adjacent one lengthwise extremity of said slot;

said slot extending continuously to the other and free extremity of said mandrel;

a sheath surrounding at least a portion of said mandrel and providing for frictional engagement of a work fabric panel interposed therebetween by the rotation of said mandrel;

and means for sustaining said mandrel axis in substantial alignment with the line of stitch formation of said sewing machine during sewing of a line of stitches by said sewing machine in said folded fabric panel edge.

4,517,908

AUTOMATIC NOTCHING DEVICE IN A SEWING MACHINE

Kwang S. Park, Incheon, D.P.R. of Korea, assignor to Daewoo Heavy Industries Ltd., Incheon, D.P.R. of Korea

Filed Jun. 12, 1984, Ser. No. 619,938
Claims priority, application D.P.R. of Korea, Sep. 9, 1983, 83-7970
Int. Cl.³ D05B *37/02*
U.S. Cl. 112—129 **1 Claim**

1. An automatic notching device in a sewing machine comprising;

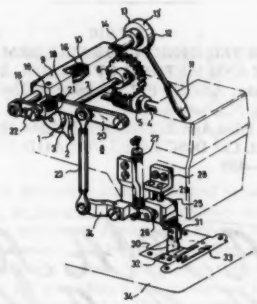
a worm fixedly mounted to a driving shaft of the sewing machine,

a rotating shaft provided at one end thereof with a worm gear engaging with said worm,

a cam mounted to the other end of said rotating shaft, said cam having a cam portion formed with a plurality of protrusions and a cylindrical boss portion,

an actuating shaft provided at one end thereof with a roller engaging with said cam,

a link provided at one end thereof with a bearing member supporting said actuating shaft, said link being pivotable about the other end thereof,



a yoke provided with a slot receiving the other end of actuating shaft, said actuating shaft being slideable in said slot,

a push rod connected at one end thereof to said yoke and having at the other end thereof a lever,

a swing arm connected at one end thereof to said link via a linkage member, and

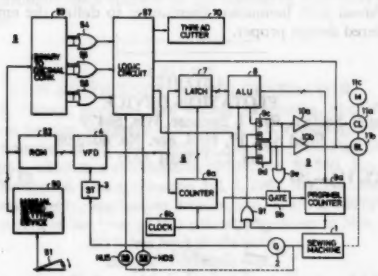
a cutter mounted to the other end of said swing arm.

4,517,909

SEWING MACHINE HAVING A DIGITAL COMMAND CIRCUIT

Shigeo Neki, Osaka; Nozomu Shinozaki, and Takashi Dohi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 11, 1982, Ser. No. 387,433
Claims priority, application Japan, Jun. 15, 1981, 56-91875
Int. Cl.³ D05B *69/18, 69/24*
U.S. Cl. 112—275 **13 Claims**



1. A sewing machine having a manually operated pedal, comprising:

position detection means for detecting the position of said pedal and generating therefrom a pedal position indicating digital signal;

means for organizing a plurality of said digital signals which are derived respectively from adjacent positions of said pedal and generating therefrom a command signal indicating a specified operating condition of the sewing machine; and

means for controlling said sewing machine in accordance with said command signal;

wherein said organizing means comprises means for converting the position indicating digital signals to corresponding mode command signals and memory means for storing a set of speed command digital signals each of which is read out of the memory means in response to said position indicating digital signals for controlling the speed of said sewing machine at speeds associated with said mode command signals.

4,517,910

EMBROIDERED DESIGN FOR SECUREMENT TO AN ARTICLE AND METHOD OF MAKING THE SAME

Lewis Jalowsky, Arecibo, P.R., assignor to Joy Insignia, Inc., Guttenberg, N.J.

Filed Apr. 7, 1982, Ser. No. 366,193
Int. Cl.³ D05C *3/00, 17/00*; A41D *27/08*
U.S. Cl. 112—439 **9 Claims**

1. A method of producing an embroidered design adapted to be heat sealed to another article to simulate a design embroidered directly onto such article comprising the steps of

(a) embroidering a design with embroidering thread onto a substrate, said design including an inner loop defined by the inner periphery thereof,

(b) laminating to the underside of the substrate a low melt thermoplastic adhesive film to form a substrate and thermoplastic film lamination,

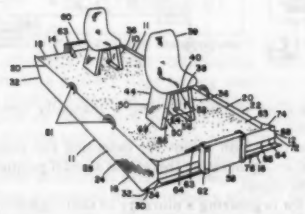
(c) tracing the inner and outer periphery of the embroidered design with a severing tool to sever all portions of the lamination including said inner loop, except only the embroidering thread and the lamination portion directly thereunder, whereby there remains only the embroidering thread with lamination thereunder to define the embroidered design proper.

4,517,911

FLOTATION DEVICE

Wayne F. Seefeld, Rte. 1, Spencer, Wis. 54479

Filed Apr. 19, 1984, Ser. No. 601,908
Int. Cl.³ B63B *7/00*
U.S. Cl. 114—267 **13 Claims**



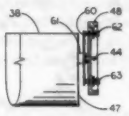
1. A pontoon flotation device having forward and rearward ends and comprising at least two parallel pontoons and a substantially rectangular deck panel extending lengthwise between the forward and rearward ends and supported on the pontoons, the deck panel having an upturned side flange extending the length of each side of the deck panel with a pontoon located parallel to and beneath each side of the deck panel, each pontoon including a substantially rectangular bottom panel and inner and outer upwardly extending side panels joined to opposite long edges of the bottom panel, the outer side panel extending upwardly beyond the furthest upward extension of the inner side panel to extend parallel and adjacent to a side flange of the deck panel, whereupon the deck panel and the outer side panel of the pontoon are in position to be conveniently fastened to each other.

4,517,912

HYDROFOIL CONTROL

Clyde B. Jones, 3531 Alginet Dr., Encino, Calif. 91436

Filed Aug. 16, 1982, Ser. No. 408,710
Int. Cl.³ B63B *1/18*
U.S. Cl. 114—275 **13 Claims**



1. In a boat having a hull and propulsive means, said hull adated to be supported on a body of water by flotation and supported dynamically above said body of water by hydrofoils, said hull including apparatus for dynamic support and control of the height of said hull above said body of water, said apparatus comprising:

(a) a main hydrofoil having a chord plane, an angle of attack, a leading edge, a trailing edge and a load vector,

(b) a strut means adapted to structurally support said main hydrofoil,

(c) a hull attachment means for attaching said strut means to said hull,

(d) a foil attachment means for attaching said main hydrofoil to said strut means, said strut means projecting from said hull attachment means and placing said main hydrofoil in a submerged position within said body of water,

(e) a pivot means, associated with said strut means and said main hydrofoil, being constructed and arranged to provide freedom of motion of at least a portion of said main hydrofoil relative to said hull such that said freedom of motion results in a change in said main hydrofoil's angle of attack,

(f) a control hydrofoil associated with said main hydrofoil by connecting means, said connecting means being constructed and arranged such that when said hull is dynamically supported above said body of water, vertical displacement of the control hydrofoil relative to said hull provides regulation of at least a portion of said main hydrofoil resulting in said chord plane assuming various angles of attack such that displacement of said control hydrofoil toward the hull causes an increase in angle of attack of said main hydrofoil,

(g) the improvement comprising: said pivot means being constructed and arranged at a position aft of said control hydrofoil, at least one main hydrofoil chord length above said main hydrofoil and such that the extension of said load vector passes aft of and within one said main hydrofoil chord length of said pivot means axis when said main hydrofoil is in operating position, whereby a decreasing moment of said load vector about said pivot means axis

may be attained with an increasing said angle of attack of said main hydrofoil,

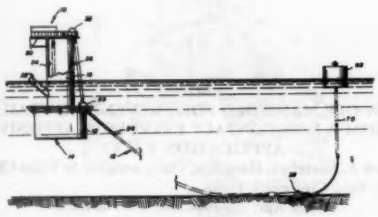
(h) whereby said control hydrofoil, in cooperation with the main hydrofoil, seeks and maintains said submerged position, while controlling said height of said hull above the body of water.

4,517,913

MOORING SYSTEM WITH FRANGIBLE LINKS

Rocco D. Albertini, Concordville, and Thomas V. Grzeczkowski, Ridley Park, both of Pa., assignors to Baldt Incorporated, Chester, Pa.

Filed Feb. 3, 1984, Ser. No. 576,953
Int. Cl.³ B63B 21/50
U.S. Cl. 114—293 19 Claims



1. In a semi-submersible drilling rig or the like having a plurality of chain lockers, a plurality of anchor windlass assemblies and a plurality of fairlead assemblies, a plurality of lengths of chain each having a multiplicity of interconnected links configured to move from a chain locker in cooperative relation through an associated anchor windlass assembly and an associated fairlead assembly, an anchor for each length of chain, and means connecting each anchor to the end of the associated length of chain outboard of the associated fairlead assembly so as to engage with the water bottom, the improvement which comprises

each of said lengths of chain having at least one link normally disposed within the associated chain locker inboard of the associated anchor windlass and fairlead assemblies of a different construction with respect to the remaining links of the associated length of chain,

each one link including a plurality of removably interconnected parts operable when interconnected to interengage with the adjacent links of the associated length of chain,

the parts of each one link including frangible means operable to be tensioned when said one link is moved outboard of the associated anchor windlass and fairlead assemblies and a predetermined emergency load is imposed upon the portion of said length of chain extending from said anchor to the links thereof beyond said one link,

the frangible means of each one link having precision configured cross-section calibrated to separate by material failure when said predetermined emergency load is imposed on the associated one link as aforesaid, and release the interengagement thereof with the adjacent links,

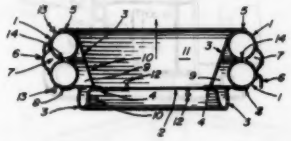
the remaining links of each length of chain including those within the portion of the length of chain between the associated one link and the associated anchor having a strength sufficient to withstand without failure loads imposed thereon greatly in excess of said predetermined emergency load.

4,517,914

INFLATABLE REVERSIBLE LIFERAFT

Vincent Geracitano, 9140, 6th Ave., Montreal, P.Q., Canada H1Z 2T8

Filed Jun. 6, 1983, Ser. No. 501,766
Claims priority, application Canada, Jun. 7, 1982, 404597
Int. Cl.³ B63B 7/00
U.S. Cl. 114—345 7 Claims



1. An inflatable reversible liferaft designed to carry several persons, having an integral reserve buoyancy compartment protected against accidental damage and having a circumferential buoyancy member, said buoyancy compartment having, when inflated, sufficient buoyancy to support the weight of the passengers while still providing a safe measure of freeboard in the event said circumferential buoyancy member should fail, said liferaft further having a passenger compartment which, when loaded, possesses inherent buoyancy by virtue of its displacement, said buoyancy member comprising a flexible inflatable, generally tubular, circumferential buoyancy chamber impermeable to air and water and having a plan shape that is circular or oval, said plurality of buoyancy chambers being of substantially identical dimensions and plan shape and being superimposed upon each other and fixedly united to each other along their respective line of juncture, a flexible, water-impermeable floor member of the same general plan shape as the area encompassed within the inner contours of said buoyancy member and being of substantially smaller dimensions than said area, two substantially annular connecting members, both of substantially identical dimensions, both fixedly and flexibly united at their respective inner circumferences to the circumference of said floor member with the first of said substantially annular connecting members being fixably and flexibly united at the outer circumference thereof to the top of said buoyancy member and with the second substantially annular connecting member being fixably and flexibly united at the outer circumference thereof to the bottom of said buoyancy member.

4,517,915

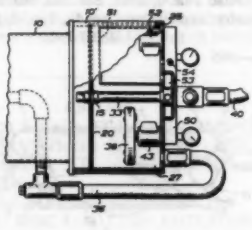
LOW-FREQUENCY SOUND GENERATOR

Mats A. Olsson, Bromma, and Roland Sandström, Skellefteå, both of Sweden, assignors to Infrasonik AB, Finspang, Sweden

Continuation of Ser. No. 298,244, Aug. 31, 1981, Pat. No. 4,359,962, which is a continuation of Ser. No. 53,560, Jun. 29, 1978, abandoned. This application Jul. 7, 1982, Ser. No. 396,074
Claims priority, application Sweden, Jul. 3, 1978, 7807473
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.³ G10K 10/00
U.S. Cl. 116—137 R 5 Claims

1. In a low-frequency sound generator having as a sound emitter an open resonator tube for generating standing gas-borne sound waves which produce a varying gas pressure in the resonator tube, and a feeder system having a movable valve slide member for controlling the supply of pressurized gas to the resonator tube, the improvement comprising a membrane forming a partition in the resonator tube that is connected with the valve slide member to form a movable unit therewith, said valve slide member being in a partly open position when the membrane is at rest in an equilibrium position, said membrane being independent of the pressure of the pressurized gas supplied to the resonator tube but operable in response to changes in the gas pressure in the resonator tube to provide positive

feedback of said pressure to the valve slide member of the feeder system only at a predetermined resonant frequency of the resonator tube, the resonance frequency of said movable



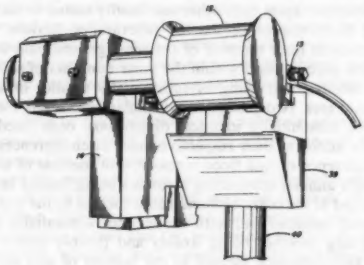
unit being higher than the frequency of the fundamental tone of the resonator tube but lower than the frequency of the first harmonic thereof.

4,517,916

APPLICATOR FOR TREATING TEXTILE FILAMENTS WITH CHEMICAL TREATMENTS

Herbert W. Barch, Natrona Heights; George T. Salego, Brackenridge, and Rudolph Blair, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,162
Int. Cl.³ B05C *1/08*
U.S. Cl. 118—234 **9 Claims**



1. An applicator for applying chemical treatment to filaments, comprising:

a. a support means positioned in proximity to a plurality of moving continuous filaments,

b. cylindrical, rotatable applicating means with a flange at each end of the cylindrical surface, where the means is rotatably mounted in the support means in a horizontal position to contact the plurality of continuous filaments traveling by the applicating means,

c. delivery means having a longitudinal slot leading from a cavity, where the slot is between tapered opposing corners adapted to fit between the flanges on the cylindrical surface of the applicating means so that the slot has a length to accommodate the longitudinal length of the cylindrical surface of the applicating means from the inside of one flange to the inside of the other flange, and where the delivery means is movably fastened to the support means to be in fluid contact with the rotatable applicating means when the opposing tapered corners are between the flanges of the rotatable applicating means to enable fluid chemical treatment supplied to the cavity of the delivery means to flow through the slot and contact the peripheral surface of the rotating applicating means so that the fluid chemical treatment can flow and contact a sufficient longitudinal portion of the peripheral surface of the cylindrical rotatable applicating means to transfer the chemical treatment to the plurality of moving filaments contacting the rotating applicating means, where the sufficient longitudinal portion is other than where the filaments contact the cylindrical rotatable applicating means, and

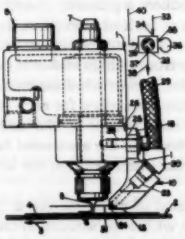
d. fluid flow control means in fluid contact with the delivery means to supply a quantity of fluid chemical treatment to the cavity of the delivery means in order that a controlled continuous quantity of fluid chemical treatment flows through the slot of the delivery means to contact a peripheral longitudinal portion of the rotatable applicating means that is rotating to carry the chemical treatment to contact the plurality of moving continuous filaments.

4,517,917

BLOW-OFF MANIFOLD FOR PREVENTING TRAILING FROM A NON-CONTACT EXTRUSION ADHESIVE APPLICATION VALVE

Richard A. Santefort, Hamilton, Ohio, assignor to Valco Cincinnati, Inc., Cincinnati, Ohio

Filed Apr. 26, 1984, Ser. No. 604,052
Int. Cl.³ B05B *15/04*
U.S. Cl. 118—302 **11 Claims**



1. In a system for applying a coating to the surface of a moving workpiece of the type having conveying means for moving the workpiece along a predetermined path of travel, and applicator means for applying a coating of liquid material to a predetermined location on a major surface of the workpiece including nozzle means spaced adjacent said major surface for dispensing the liquid material in a relatively thin stream toward the workpiece surface, said applicator means including means for initiating and for terminating the dispensing of the coating material, the improvement in combination therewith comprising means for preventing trailing of the coating material on the workpiece surface following termination of the dispensing of the coating material including a pair of spaced apart blow-off orifices positioned to direct a thin jet of air on either side of the stream of coating material being dispensed from the nozzle means and generally in the direction of path of travel of the workpiece, and means for producing said air jets immediately following termination of the dispensing of the coating material, said jets being operable to momentarily entrain the stream and draw it generally in the direction of the path of travel of the workpiece.

4,517,918

CRYSTAL PLATING CHAMBER APPARATUS

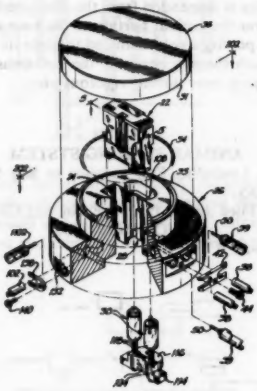
Alan Kaplan, W. Caldwell, N.J., assignor to Emkay Manufacturing Co., East Hanover, N.J.

Continuation-in-part of Ser. No. 369,401, Apr. 19, 1982, Pat. No. 4,419,379, and Ser. No. 194,078, Oct. 6, 1980, Pat. No. 4,367,579, which is a continuation of Ser. No. 034,780, Apr. 30, 1979, Pat. No. 4,236,487, said Ser. No. 369,401, is a continuation of Ser. No. 193,935, Oct. 6, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,338

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ C23C 13/12

U.S. Cl. 118—723 9 Claims



1. A crystal plating device comprising:

(a) a base having a power circuit and means for an oscillating circuit therein;

(b) a chamber formed in the base;

(c) a sealed top enclosing the chamber;

(d) at least one pair of filament posts affixed to the base disposed within the chamber and in the power circuit;

(e) at least one of said filament post comprises a hollow body having an insulating sleeve thereon and threadedly received on a member affixed to the base, a slot in the body near the upper end and a spring biased pivotable lever, the filament disposed within the slot, whereby pivoting the lever will permit the selective engagement and disengagement of the filament in the slot;

(f) a filament connected across the filament posts, wherein the filament posts are positioned in the chamber adjacent the crystal to provide effective plating of the crystal;

(g) a crystal holder adapted to releasably support a crystal removably connected with the base;

(h) a crystal in the oscillating circuit and carried by the crystal holder; and

(i) said chamber adapted to be connected to a pump to vacuum pump the chamber, whereby energizing the circuits will oscillate the crystal and evaporate the filament to plate the crystal and produce the desired frequency therefore.

4,517,919

ANIMAL LITTER COMPOSITION

Lawrence Benjamin; Sheila S. Rodriguez, both of Cincinnati, and Nancy A. Meinberg, Okeana, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 1, 1983, Ser. No. 547,596

Int. Cl.³ A01K 1/015

U.S. Cl. 119—1 17 Claims

1. A solid absorbent material useful as an animal litter, having adsorbed thereto from about 1000 ppm to about 10,000 ppm undecylenic acid.

4,517,920

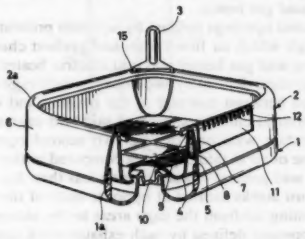
DOMESTIC PETS' CHAMBERPOT

Yoshikazu Yamamoto, 1-1, 3-chome, Eganosho, Habikino, Japan

Filed Jan. 3, 1984, Ser. No. 567,539

Int. Cl.³ A01K 29/00

U.S. Cl. 119—1 5 Claims



1. A chamberpot for domestic pets, comprising

a lower frame member having a lower portion and extending upwardly therefrom an erect wall; and

an upper frame member comprising

an outer wall formed along a periphery thereof and insertably fixed on said erect wall of said lower frame member,

an inner wall connected to said outer wall and forming a space therebetween for placement of a deodorizer, an aromatic or an inciting agent,

a bottom portion formed substantially normal to said inner wall and connecting the inner wall and further having a mesh netting shape, and

venting means disposed toward the connecting part of said inner wall and said outer wall and accessible to said space for venting said deodorizer, aromatic or inciting agent.

4,517,921

ANIMAL REARING HOUSE

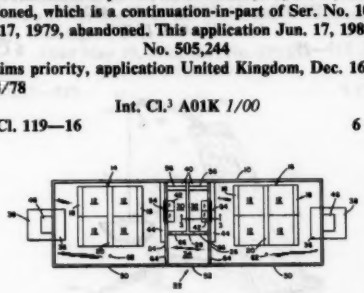
James A. Haythornthwaite, Willow Lodge, Church Rd., Warton, Preston, Lancashire PR4 1BD, England

Continuation-in-part of Ser. No. 280,495, Jul. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,677, Dec. 17, 1979, abandoned. This application Jun. 17, 1983, Ser. No. 505,244

Claims priority, application United Kingdom, Dec. 16, 1978, 48938/78

Int. Cl.³ A01K 1/00

U.S. Cl. 119—16 6 Claims



1. An animal rearing pen particularly for weaner pigs, said pen comprising:

an elongated house including a floor, side walls, end walls and a roof,

an air intake defined by said floor located centrally, intermediate the ends of the house for air to enter into said house,

a first baffle located in the central portion, intermediate the ends of the house and located above said air intake, said

first baffle communicating with said air intake and being located in the path of travel of air entering the house through the air intake for slowing down the air entering into the house and separating the incoming air into two streams,

two preheat chambers located in said central portion, intermediate the ends of said house defining two first openings communicating with said first baffle through which said two air streams enter said two preheat chambers, said preheat chambers including a gas heater for raising the temperature of the air streams and an electric heater for raising the temperature of the air streams to a lesser extent than said gas heater,

two second openings defined by said two preheat chambers through which air flows from said preheat chamber after passing said gas heater and said electric heater,

two cage areas defined by said housing, each cage area being located between one end of the housing and one of the two preheat chambers, each of said two cage areas communicating with one of said two second openings, the volume of air in said cage area compared to the volume of air in said preheat chamber being less than 8:1,

air exhaust stacks located at opposite ends of the house for exhausting air from the cage areas to the atmosphere,

a third opening defined by each exhaust stack communicating with said cage areas for exhausting air from the cage areas to the exhaust stacks,

second baffles each extending from each end wall of the house and projecting downwardly in front of said third opening and being spaced from said third opening,

variable speed exhaust fans located in each of said exhaust stacks for pulling air from said air intake to said preheat chambers, from said preheat chambers to said cage areas and from said cage areas to said exhaust stacks in a direction along the longitudinal axis of the house,

doors located in the side of said house communicating with said cage areas, and

temperature sensing means mounted in said cage areas,

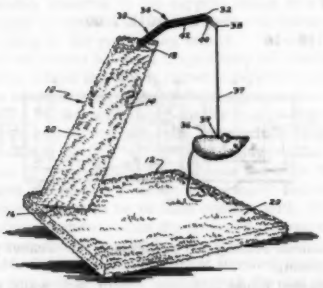
means for controlling the temperature of each air stream, the speed of said variable speed exhaust fans and the amount of heat produced by said gas heater and said electric heater being simultaneously controlled by said means for controlling the temperature of each air stream dependent on the temperature sensed by said temperature sensing means compared to a predetermined set point.

4,517,922

PET AMUSEMENT DEVICE

Jeannine H. Lind, Glen Rte., Box 220, Aitkin, Minn. 56431

Filed Sep. 24, 1982, Ser. No. 422,833
Int. Cl.³ A01K *15/00*
U.S. Cl. 119—29 **6 Claims**



1. A pet amusement device which comprises:

a generally flat, generally horizontal base;

a single post secured to the base adjacent its periphery, said post extending upwardly at an acute angle relative to the base in such a manner that an upper end of the post is positioned over and above a central portion of the base, and the base having no other posts extending upwardly therefrom;

an elongated member having a resiliency greater than that of said post secured to the upper end of the post and extending when in an unstressed condition outwardly and upwardly therefrom in such a manner that a free outer end of the elongated member is positioned over and above the central portion of the base;

a pet toy constituted as a soft skinned, mouse-sized object impregnated with a scented animal lure;

a cord attached to the pet toy; and

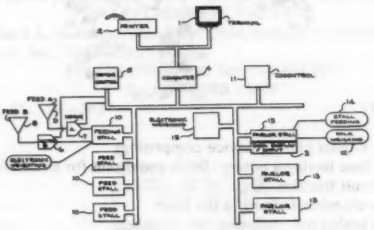
fastening means for selectively securing the cord to the free outer end of the elongated member in such a manner that the pet toy is suspended from the elongated member generally over the central portion of the base so that to play with the pet toy a pet is induced to place its weight on the base which thereby prevents the pet amusement device from tipping over during vigorous play.

4,517,923

ANIMAL FEEDING SYSTEM

Tom Palmer, Louisville, Ky., assignor to Key Systems, Inc., Louisville, Ky.

Filed Jul. 7, 1983, Ser. No. 511,528
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51 R **13 Claims**



1. A system for feeding animals including means for identifying individual animals and computer control means for providing individualized amounts of a feed to animals comprising means for collecting information concerning an animal's weight, means for storing information relating to an animal's weight, means for storing a weight gain curve relating to an animals' predicted weight gain over a weight gain cycle, means for comparing the information about the weight gain curve over the weight gain cycle with information regarding the animal's actual weight gain and for determining the variance between actual weight gain and predicted weight gain according to the curve and means for feeding the animal based on said variance.

4,517,924

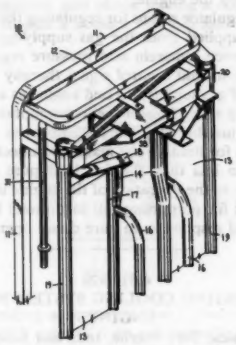
ANIMAL HEADGATE

Duane A. McCan, and Carl L. Smith, Jr., both of Lexington, Nebr., assignors to Valley Sales Co., Lexington, Nebr.

Filed May 31, 1984, Ser. No. 615,657
Int. Cl.³ A01K *1/062*
U.S. Cl. 119—98 **8 Claims**

1. In an animal headgate having a forward portion and a rearward portion on a stationary frame, first and second gate pivot members pivotally connected to said stationary frame, first and second gates attached to said gate pivot members, said gates being movable among receive, latch and release positions, first animal securement means attached to said gates for substantially restraining movement of an animal, and a locking means for selectively locking said gates in the latch position to

restrain said animal, an improvement comprising second animal securement means operably affixed to said gates for further restraining movement of said animal wherein said second



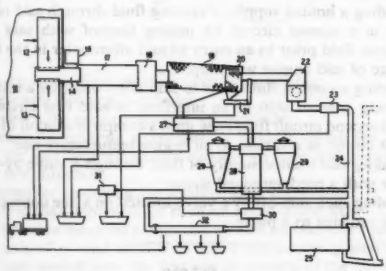
animal securement means are vertically disposed and positioned forward of said first animal securement means thereby creating a restrained and exposed area on a restrained animal between said first and second animal securement means.

4,517,925

HIGH EFFICIENCY REFUSE-DERIVED-FUEL SUPPLYING SYSTEM FOR INDUSTRIAL BOILERS

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Houston, Tex., assignors to New Life Foundation, Wheaton, Ill.

Filed Nov. 9, 1983, Ser. No. 549,886
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—2 **22 Claims**



1. A uniform, high quality refuse derived fuel (RDF) supplying system for maintaining a plurality of industrial boilers operating continuously at peak efficiency, and comprising:

a plurality of RDF storage units at least equal in number to the plural number of boilers to be supplied with RDF;

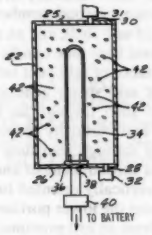
means for loading RDF from a source into said storage units; and means for selectively delivering the RDF from any of said storage units to any of the boilers.

4,517,926

DEVICE FOR IMPROVING FUEL EFFICIENCY AND METHOD OF USE THEREFOR

George G. Reinhard, Warren; Ronald Kinde, Mt. Clemens, both of Mich., and Bernard S. Singer, Haifa, Israel, assignors to Optimizer, Limited, Flint, Mich.

Filed Apr. 19, 1982, Ser. No. 369,618
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—3 **10 Claims**



1. A device for increasing the fuel effiency of an internal combustion engine and having a fuel supply conduit for conducting fuel from a fuel supply to a combustion chamber comprising:

a housing having inlet and outlet ports, said housing disposed in fluid flow communication with said fuel supply conduit between said fuel supply and said combustion chamber;

a heat source for maintaining the temperature within the housing at a temperature ranging from about the ambient to about less than 100° C.

a plurality of metallized pellets disposed within the housing; and

wherein fuel entering said housing through said inlet port contacts the pellets to dissolve some metal therewithin, and further wherein the fuel enters the housing as a liquid and exits the housing as a liquid.

4,517,927

STEAM GENERATOR FOR LIQUID METAL FAST BREEDER REACTOR

James E. Gillett, Greensburg; Daniel C. Garner, Murrysville; Arthur L. Wineman, Greensburg, and Robert M. Robey, North Huntingdon, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,812
Int. Cl.³ F22B *37/24*
U.S. Cl. 122—510 **9 Claims**

1. A steam generator for a liquid metal fast breeder nuclear reactor comprising:

a J-shaped tube bundle disposed between tube sheets and

mounted in a J-shaped housing surrounding said tube bundle, the major portion of said tube bundle and said housing being vertically oriented and a smaller portion of said tube bundle and said housing being bent through at least about 90° and extending from the upper portion of said vertically oriented tube bundle major portion to provide for differential thermal expansion between said tube bundle and said shell;

a vertically oriented shroud member surrounding the substantial portion of said vertically oriented tube bundle, said vertically oriented shroud member being spaced from the inner surface of said shell, and an elbow shroud member surrounding said bent tube bundle portion and spaced from the nearest tubes of said bent tube bundle portion;

during operation of said steam generator, liquid metal is pumped into said shell through an inlet proximate the upper portion of said vertically oriented shell portion to flow downwardly through said tube bundle within said vertically oriented shroud member and about the individual tubes of said vertically oriented tube bundle and then to flow radially from the lower portion of said tube bundle and then to flow from an exit proximate the lower portion of said vertically oriented shell, and heat transfer fluid flowing upwardly through the tubes of said vertically oriented tube bundle to be heated by said liquid metal and then to exit from said bent tube bundle portion;

a plurality of tube spacer plate members horizontally disposed within said vertically oriented shroud member and operable to maintain the proper radial spacing between individual tubes, said spacer plate members spaced a small amount from the inner surface of said vertically oriented shroud member to permit a small radial deflection of said supported tubes; and

a plurality of support grid members supported within said elbow shroud for supporting the individual tubes within said bent tube bundle, and said support grid members providing lateral tube support for every other row of tubes within said bent tube bundle to permit expansion of said tubes in a vertical direction without tube buckling or binding.

4,517,928

SYSTEM FOR THE USE OF GAS AS SECONDARY FUEL IN DIESEL ENGINES

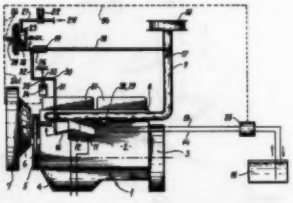
Leendert Wolters, Rhoon, Netherlands, assignor to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Aug. 2, 1983, Ser. No. 519,562

Claims priority, application Netherlands, Aug. 12, 1982, 8203169

Int. Cl.³ F02M *1/16, 21/00*

U.S. Cl. 123—27 GE **14 Claims**



1. A system for the use of gas as a secondary fuel in a diesel engine of the high speed automotive type, having a substantially integral injection pump and speed governor unit for supplying diesel fuel, said system comprising:

means for supplying gas in an amount to act as a secondary fuel;

means including a mixing device for introducing said gas into aspirated combustion air;

means for obtaining a control signal at least substantially proportional to the momentary rate of diesel fuel consumption by the engine;

a pressure regulator means for regulating the gas pressure of the gas supplied from the gas supplying means to said mixing device, wherein said pressure regulator means is responsive to said control signal thereby to regulate the quantity of gas supplied to said engine as a function of the momentary rate of diesel fuel consumption; and

remotely adjustable stop means acting on said governor-pump unit for limiting the maximum injectable diesel fuel quantity to less than the full load pure diesel quantity responsive to the operation of the engine in the diesel/gas mode, and for permitting full load diesel fuel quantity to be supplied responsive to pure diesel operation.

4,517,929

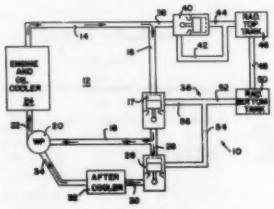
SELF-ADJUSTING COOLING SYSTEM FOR DIESEL ENGINES

Donald R. Musick, Fort Wayne, Ind., and Edward H. Howell, Moreland Hills, Ohio, assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 23, 1983, Ser. No. 535,197

Int. Cl.³ F01P *3/12*

U.S. Cl. 123—41.1 **11 Claims**



1. A method of reducing the temperature of a cooling fluid passing through an aftercooler for cooling the air supplied to an internal combustion engine having a radiator, said method comprising:

providing a large recirculating flow of a cooling fluid at an initial stage of said engine warm-up through said engine in a first circuit including a branch line going through said aftercooler;

providing a limited supply of cooling fluid through said radiator in a second circuit for mixing thereof with said first circuit fluid prior to an entry to said aftercooler in the final stage of said engine warm-up;

providing a coolest fluid flow to said aftercooler by a self-adjusting gradual shift of an interflow of said first circuit to said second circuit fluid flow until a complete shut off of said first circuit in response to an engine temperature rise;

providing said limited supply of fluid through a valve by-pass line with a predetermined sizing;

providing such shut-off by a valve located on a line connecting said radiator to a pump.

4,517,930

PISTON OF COMBUSTION ENGINE

Hideaki Nakano, Akashi; Tadahiro Ozu, Kobe, and Eiichi Shirai, Amagasaki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

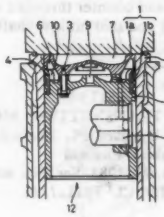
Filed Sep. 28, 1982, Ser. No. 425,340

Int. Cl.³ F01P *3/10*

U.S. Cl. 123—41.31 **5 Claims**

1. A piston for an internal combustion engine, said piston being adapted to reciprocate in an engine cylinder and to

support one or more piston rings which slidingly engage the wall of the cylinder, said piston comprising a crown and a skirt fixed together, said crown including an upper part of relatively low heat-conductive metal and a ring carrier of relatively high heat-conductive metal, said upper part and said ring carrier being welded together, said piston having a cooling chamber formed therein to pass a coolant through said chamber, said



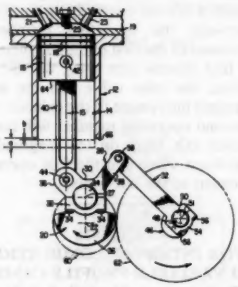
upper part including a relatively thin cylindrical peripheral wall portion which extends from substantially the upper surface of said crown to said ring carrier, whereby said ring carrier is separated from said upper surface by said peripheral wall portion, and the outer surfaces of said peripheral wall portion and said ring carrier are substantially aligned and are closely adjacent said wall of said cylinder.

4,517,931

VARIABLE STROKE ENGINE

Carl D. Nelson, Rte. 1, Ennis, Tex. 75119

Filed Jun. 30, 1983, Ser. No. 510,288
Int. Cl.³ F02B *75/04*
U.S. Cl. 123—48 B **14 Claims**



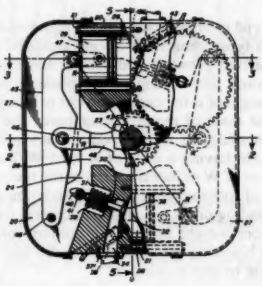
1. An internal combustion engine comprising:
structure defining a cylinder;
a piston for reciprocation in said cylinder;
means for entering a combustible mixture within the cylinder and combusting said mixture to urge said piston in a first direction;
means for removing the mixture after combustion;
a first shaft mounted for rotation about a first axis;
a trunnion mounted for pivotal motion on said first shaft, the axis of pivotal motion of said trunnion being parallel to and spaced from the first axis of rotation of the first shaft;
a connecting rod pivotally connected to the piston at a first end thereof and pivotally connected to the trunnion at a second end thereof, the piston therefore being connected directly to the first shaft through the connecting rod and the trunnion;
a second shaft mounted for rotation about a second axis;
a control link rotatably connected to said second shaft at a first end of the control link for rotation about an axis parallel to and spaced from the second axis, said control link being pivotally connected at a second end thereof to the trunnion;
means for connecting the first shaft and second shaft for joint rotation with a predetermined ratio of angular velocity; and
the intake stroke of said engine being shorter than the power stroke of the engine to increase the power output of the engine.

4,517,932

PAIRED BEAM ENGINES AND PUMPS

Martin L. Nason, P.O. Box 672, Rumford, Me. 04276

Filed Sep. 28, 1982, Ser. No. 425,285
Int. Cl.³ F02B *75/06*
U.S. Cl. 123—54 A **10 Claims**



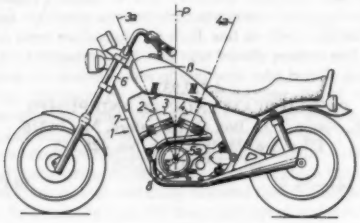
1. A paired beam expanding chamber machine such as an internal combustion engine, compressor and pump, said machine including block structure, at least one crankshaft within and rotatably supported by said block structure with its axis in a central transverse plane thereof, said block structure including at least one pair of piston-cylinder units, the cylinder of each unit having one end open and the other end closed to provide a head thereon and at least the open ends of the cylinders on opposite sides of said plane and means to effect intake and exhaust of fluids to and from each cylinder, a pair of links, each link pivotally connected to an appropriate one of said pistons, a pair of beams, said block structure having support surfaces on opposite sides of said plane to each of which one of said beams is pivotally secured, a pair of connecting rod means, one for each unit and operatively connected to said crankshaft, a pair of first pivot means, each connecting one of said beams to an appropriate one of the connecting rod means and a pair of second pivot means, each connecting one end of one of said beams to an appropriate one of said links, said pistons, links, beams and connecting rod means constituting moving paired parts of a power train with the parts of each pair so formed and positioned and an axis of said first and second pivot means so located that in any and all angular positions of said crankshaft, a plane inclusive of the axis of one of the pivot means of whichever one of said first and second pairs thereof that is selected and the crankshaft axis defines an acute angle with respect to a plane inclusive of the axis of the other pivot means of the selected pair and the axis of the crankshaft that does not exceed $\pm 4°$ and a perpendicular radial distance between the axis of said one pivot means and the crankshaft axis does not differ by more than $\pm 8\%$ with respect to a perpendicular radial distance between the axis of said other pivot means and the crankshaft axis.

4,517,933

CRANK SHAFT OF V-TYPE INTERNAL-COMBUSTION ENGINE

Kousuke Yasutake, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,589
Claims priority, application Japan, Oct. 9, 1982, 57-177987
Int. Cl.³ F02B 75/06
U.S. Cl. 123—55 VF 4 Claims



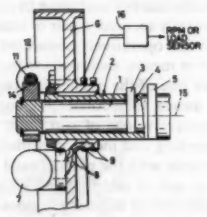
1. In a V-type internal-combustion engine including a three-web, two pin type crank shaft having a central web, and two crank pins carried between said central and each of said side webs, said crank pins having rotary phases offset from each other by an angle of α for cancelling out primary inertial force caused by the mass of reciprocating parts, the improvement wherein each said side web is respectively provided with a balancer weight having a mass of at least W/2 corresponding to half of a sum of W of half the mass of the reciprocating parts and the mass of rotating parts of one cylinder on a side opposite to a corresponding crank pin, and said central web is provided with a balancer weight having a maximum mass of $W \times \cos \alpha/2$ on a line bisecting the angle α between said crank pins on a side opposite to said crank pins.

4,517,934

CONTROLLABLE CAMSHAFT FOR A DRIVE, PREFERABLY AN INTERNAL COMBUSTION ENGINE

Stanislav Papez, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 37,697, May 10, 1979, Pat. No. 4,332,222. This application Jul. 18, 1980, Ser. No. 170,073
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930266
Int. Cl.³ F01L 1/08, 1/34
U.S. Cl. 123—90.17 6 Claims



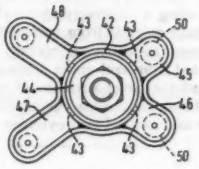
1. In a camshaft for a drive, preferably an internal combustion engine, having a hollow shaft carrying at least one cam-like part for rotation therewith, an inner shaft disposed within the hollow shaft and rotatable relative to the hollow shaft, the inner shaft having at least one cam-like part disposed outside the hollow shaft attached for rotation with the inner shaft through clearances in the hollow shaft, means for driving the camshaft including a camshaft timing gear coupled with both shafts and means responsive to a parameter characteristic of operating conditions of the drive for adjusting the rotational position of at least one of said inner shaft and said hollow shaft relative to the camshaft drive means, the improvement wherein the adjusting means comprises an electric motor means fixed on said timing gear, means for generating electrical control signals dependent upon said parameter for acting on said motor means, a threaded spindle supported on said timing gear transversely to said shafts and coupled to the output of said motor, and counter threaded means mounted on one of said inner shaft and said hollow shaft for meshing with said threaded spindle.

4,517,935

DEVICE FOR TRANSMITTING MOVEMENT

Colin T. Pomfret, 9, Duggard Pl., Barford, CV35 8DX, Nr. Warwick, Warwickshire, England

Filed Feb. 23, 1983, Ser. No. 468,914
Int. Cl.³ F01L 1/18
U.S. Cl. 123—90.4 12 Claims



1. An internal combustion engine having first and second operating members positioned substantially diagonally opposite respective inlet and exhaust valves, and a single arm for transmitting movement, from said operating members to the inlet and exhaust valves, the arm being mounted for pivotal movement about a pivotal centre lying on the intersection of diagonals between the operating members and valves, whereby movement of the first operating member will turn the arm about a first pivotal axis lying on the diagonal which extends between, the inlet valve and the second operating member to transmit movement to the exhaust valve, and movement of the second operating member will turn the arm about a second pivotal axis lying on the diagonal which extends between the exhaust valve and the first operating member to transmit movement to the inlet valve.

4,517,936

TAPPET FOR INTERNAL COMBUSTION ENGINES WITH VARIABLE PROFILE CAMSHAFTS

Antonio Burgio di Aragona, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Oct. 12, 1983, Ser. No. 541,180
Claims priority, application Italy, Oct. 12, 1982, 68194 A/82
Int. Cl.³ F01L 1/14
U.S. Cl. 123—90.5 1 Claim

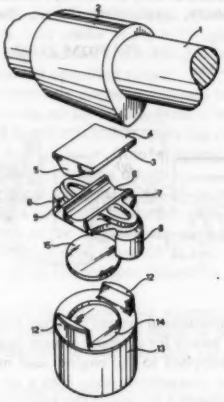
1. A tappet for engines with variable-profile cam shafts comprising:

a substantially rectangular sliding block having a flat surface for contact with a cam and a projection of part-circular section on the surface thereof opposite to said flat surface which extends parallel to the major axis of said block;

a bearing saddle for said sliding block comprising an elongated central portion having a major axis parallel to the major axis of said block with an elongated groove in the upper surface of said central portion parallel to the major axis thereof receiving said projection of said sliding block and having two semi-cylindrical guides disposed on opposite sides of said saddle portion fo engagement with complementary seats in an engine head to prevent rotation of said saddle about a valve axis;

a cylindrical cup having an upper surface with two spaced

apart tabs protruding axially therefrom to define a seat for receiving said bearing saddle for withstanding the thrust generated by the sliding of the cam on said sliding block and a cylindrical seat disposed between said tabs; and



tappet adjustment means engageable in said cylindrical seat of said cup.

4,517,937

INTERNAL COMBUSTION ENGINE

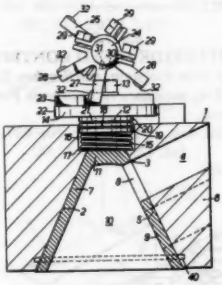
Herbert Ball, Peny Graig, Saron, Llandyssul, Dyfed, Wales (SA44 5EW)

Filed Sep. 20, 1983, Ser. No. 533,966

Claims priority, application United Kingdom, Sep. 21, 1982, 8226883

Int. Cl.³ F01L *7/00*

U.S. Cl. 123—190 D **11 Claims**



1. A four stroke internal combustion engine comprising a cylinder block in which is formed a cylinder bore, a piston arranged for reciprocation within the cylinder bore, a cylinder head mounted on the cylinder block and having a conical valve seat embodying inlet and exhaust ports, a conical valve complementary with the valve seat and embodying port hole means via which the inlet or exhaust ports are arranged to communicate with the cylinder bore consequent upon predetermined rotary movement of the valve, and valve rotating means operative to produce at appropriate times during the engine cycle, predetermined rotary movement of the valve in one direction so as to place the inlet port in communication with the cylinder bore via the port hole means or predetermined rotary movement of the valve in the opposite direction so as to place the exhaust port in communication with the cylinder bore via the port hole means, and indexing means operative temporarily to hold the valve stationary during periods of the engine cycle when high pressure is present in a combustion chamber with which the cylinder bore is placed in communication for minimizing wear of mating surfaces of the valve and the valve seat.

4,517,938

ROTARY VALVE ARRANGEMENT

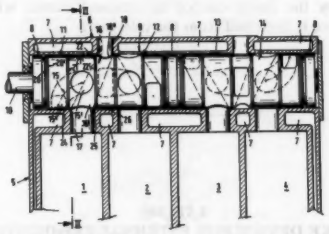
Hermann Krüger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,763

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241723

Int. Cl.³ F01L *7/10*

U.S. Cl. 123—190 E **15 Claims**



1. A rotary valve arrangement for an internal combustion engine, comprising a housing having a plurality of cylinders with corresponding passages, an intake gas passage and an exhaust gas passage, a rotary valve member mounted for rotation in the housing and having inlet and outlet passages for intake and exhaust gases with ports which, from time to time, are aligned with cylinder intake and exhaust passages in the housing, depending on the angle of rotation, and a plurality of dry-bearing sealing rings retained in corresponding grooves surrounding the valve member and axially adjacent to the ports in the valve member, wherein the dry-bearing sealing rings have an anti-friction material on the sliding surface thereof, the valve arrangement further comprising at least one heat resistant dry surface bearing seal provided between the valve member and the housing in the spaces between the dry-bearing sealing rings so as to inhibit peripheral leakage of gases therebetween.

4,517,939

DUST COLLECTING DEVICE

Katsumi Kiyooka, Warabi, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,552

Claims priority, application Japan, Jun. 19, 1981, 56-89470[U]; Jul. 3, 1981, 56-98600[U]; Jul. 3, 1981, 56-98601[U]; Aug. 14, 1981, 56-120047[U]

Int. Cl.³ F02B *63/02*

U.S. Cl. 123—198 E **4 Claims**

1. The improvement in a portable internal combustion engine, comprising:

a casing containing at least part of the engine, said casing comprising a body and a cover closably and openably connected to the body;

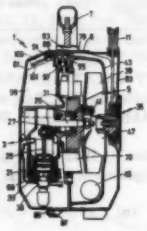
an engine fuel tank located within said casing;

said fuel tank having an inlet port for admitting fuel to the fuel tank, and a closure detachably positioned to close the inlet port;

said inlet port and said closure being concealed by said cover except when the cover is opened; and

latch means associated with said cover and responsive to the

position of said closure on the inlet port to releasably retain the cover in closed position only when the closure is blocking said inlet port,



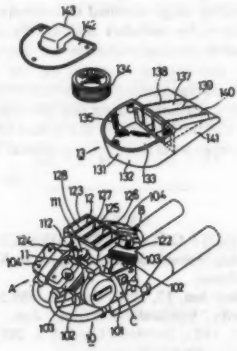
whereby the cover cannot be retained closed while the closure is detached from the inlet port.

4,517,940

INTAKE DEVICE FOR INTERNAL COMBUSTION ENGINE

Takahiro Koyanagi, and Hiromu Sakaoka, both of Asaka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,683
Claims priority, application Japan, Dec. 6, 1982, 57-213570
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—198 E **3 Claims**



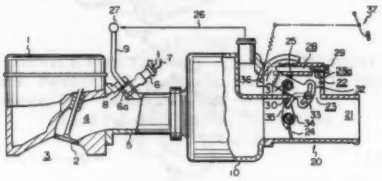
1. An intake device for an internal combustion engine having a plurality of cylinders each provided with a carburetor, each of said carburetors having an intake opening connected with a carburetor base, an air cleaner located above said cylinders, said intake device comprising said carburetor base connected on the upstream side thereof to said air cleaner and on the downstream side thereof to said intake openings, said carburetor base having vertical partition means therein for evenly dividing the space defined by said carburetor base, said partition means extending substantially in the direction parallel to an imaginary line connecting each intake opening and one of the respective carburetors, each of said intake openings being joined to one of the divided spaces of said carburetor base.

4,517,941

AIR INTRODUCTION SYSTEM OF A FUEL INJECTION TYPE ENGINE

Norihisa Nakagawa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 8, 1983, Ser. No. 502,113
Claims priority, application Japan, Dec. 20, 1982, 57-191167[U]
Int. Cl.³ F02M *23/02*
U.S. Cl. 123—336 **12 Claims**



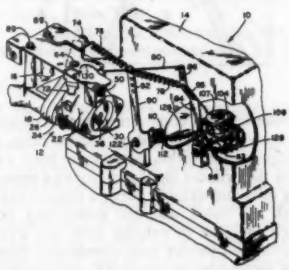
1. An air introduction system of a fuel injection type engine comprising; a means for defining a main passage for introducing air to be supplied to the engine, said main passage being divided, at the downstream side, into a set of branched passages each connected to one of the engine combustion chambers; a fuel injection provided in each of said branched passages for injecting fuel thereinto; means for supplying assist air, which is a part of said air to be introduced to the engine, to the surrounding area of a top nozzle portion of each of said fuel injectors so that the assist air acts on the fuel injected from said injector; a means for defining a second or subpassage which is connected to said main passage, said second or subpassage being divided, at the downstream side, into a set of assist air introduction conduits each connected to said assist air supplying means; a main or throttle valve disposed in said main passage at the downstream side of said connection point at which said second or subpassage is connected to said main passage; and a second or subvalve disposed in said second or subpassage upstream of said conduits.

4,517,942

OVERRIDE SPEED CONTROL

Robert J. Pirkey, New Holstein, and Stephen D. Ditter, Fond du Lac, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 3, 1984, Ser. No. 637,412
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—376 **14 Claims**



1. In a carburetor for an internal combustion engine having a body and an air fuel mixture conduit:

a choke valve in said conduit adjustable between open and closed positions for controlling the flow of air;

a throttle valve in said conduit downstream from said choke valve for controlling the flow of said air fuel mixture;

governor means mounted on said engine and driven thereby and responsive to engine speed, said governor means operatively connected to said throttle valve for adjusting said throttle valve in accordance with engine speed;

a control lever operably mounted on said body for selecting the engine speed and operatively connected to said choke valve, said lever positionable through first and second operating ranges, said choke being fully opened in said first operating range and said choke being at least partially closed in said second operating range;

enabling means operatively connected to said control lever and said governor means for enabling said control lever to select the engine speed in said first operating range and for disabling said control lever from selecting the engine speed in said second operating range.

14. A method for controlling the speed of an internal combustion engine having a governor means driven by the engine, and a carburetor with an air fuel mixture passage therein, a choke valve and throttle valve disposed in said passage for controlling the flow of air fuel mixture therethrough comprising:

selecting the speed of the engine with a control lever, said control lever moveable through a range of positions and operatively connected to said throttle valve and said choke valve;

maintaining the selected engine speed under varying loading conditions of said engine through all but the last increment of movement of said control lever;

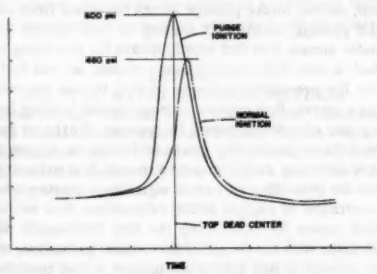
maintaining the engine speed fixed for all positions of said control lever in the last increment of movement of said operating range by disabling control of said control lever over said throttle valve while permitting adjustment of said choke valve by said control lever.

4,517,943

DYNAMIC METHODS AND APPARATUS FOR REDUCING OCTANE REQUIREMENT INCREASE

Jack A. Bert, Kensington, and R. Eric Olsen, Alameda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 15, 1983, Ser. No. 514,229
Int. Cl.³ F02P 5/04
U.S. Cl. 123—415 **6 Claims**



1. A method for removing combustion chamber deposits from an operating, spark-ignition, internal combustion engine during regular use, in which engine a normal spark-timing advance includes any speed, temperature or manifold vacuum dependent, spark-timing advance, comprising the steps of:

selecting conditions suitable for intermittently advancing spark timing in a cylinder within the range from about 0.1% to about 2% of combustion cycles in said cylinder; and

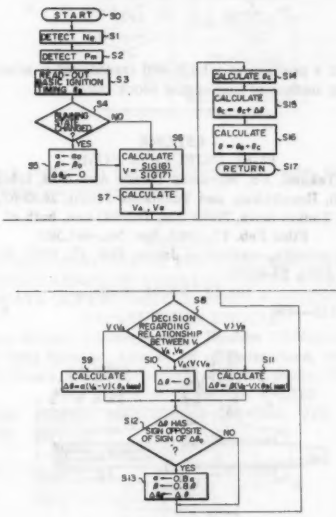
intermittently advancing spark timing beyond the normal spark-timing advance according to said selecting step in order to remove combustion chamber deposits.

4,517,944

IGNITION TIMING CONTROL FOR INTERNAL COMBUSTION ENGINES

Shingo Inoue, Anjo; Toshiharu Iwata, Aichi, and Yasuhito Takasu, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 8, 1982, Ser. No. 396,363
Claims priority, application Japan, Jul. 9, 1981, 56-106205
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **12 Claims**



1. A method for controlling ignition timing for an internal combustion engine, comprising the steps of:

detecting an engine running condition and generating a detection signal;

deciding whether a change of the engine running condition takes place;

determining, based on said detection signal and a correction factor, an amount of correction for correcting the ignition timing; and

correcting the ignition timing in an advancing or retarding correction direction based on said determined correction amount,

said amount of correction of the ignition timing being reduced with each change in the direction of correction of the ignition timing.

4,517,945

ENGINE VIBRATION TRANSMISSION STRUCTURE

Kazuhiro Ishigami, Yokohama; Shoji Furuhashi, Isezaki, and Haruo Yuzawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1982, Ser. No. 452,731
Claims priority, application Japan, Jan. 26, 1982, 57-9215[U]
Int. Cl.³ F02P 5/14
U.S. Cl. 123—425 **10 Claims**

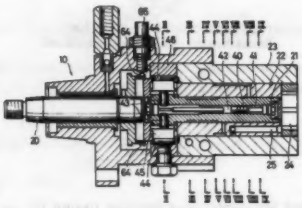
1. A structure for use in an internal combustion engine, said engine including an engine block having an engine block outer wall and a plurality of cylinder walls each defining therein a cylinder, a cooling passage defined by said engine block outer wall and said cylinder walls, and a transducer attached to an outer surface of said engine block wall for sensing vibratory forces due to internal combustion in each cylinder, said structure comprising a thickened portion of said engine block outer

walls and a position at which said transducer is attached on said outer surface of said engine block outer wall.

4,517,946
FUEL INJECTION PUMP

Yoshiya Takano, 2-5, Miyamae Terasu Apt., 978, Ichige, Katsuta-shi, Ibaraki-ken, and Yoshikazu Hoshi, 2650-62, Muramatsu, Toukai-mura, Naka-gun, Ibaraki-ken, both of Japan

Filed Feb. 17, 1983, Ser. No. 467,302
Claims priority, application Japan, Feb. 17, 1982, 57-22632; Mar. 29, 1982, 57-48906
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—450 8 Claims



1. A fuel injection pump for an internal combustion engine comprising: a rotor disposed in a housing and rotating according to running of the engine;

a pressure chamber formed in said rotor;

a first free piston slidably mounted in said pressure chamber;

first and second pump chambers defined by an inner surface of said pressure chamber and said first free piston, said first pump chamber provided with a port which is capable of communication with an interior of the engine; and said second pump chamber provided with a discharge port;

means for compressing fuel in said second pump chamber in accordance with rotation of said rotor whereby the fuel in said first chamber is compressed and delivered to said engine through said port;

first and second fuel passage means leading to said first and second pump chambers, respectively;

first and second solenoid valves, provided on said first and second passage means, for measuring amount of fuel;

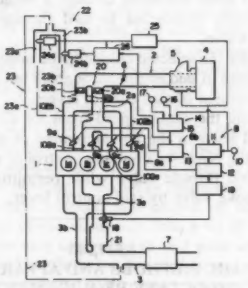
first and second preparatory chambers provided downstream of said first and second solenoid valves, respectively, said preparatory chambers being capable of communication with said first and second solenoid valves and said first and second pump chambers by said first and second fuel passage means so that the measured fuel is kept in said first and second preparatory chambers during the compression of said pump chambers and transferred to said first and second pump chambers, respectively, and

wherein said first and second preparatory chambers comprises cylinders and second free pistons movably mounted in said cylinders, respectively, and are arranged in said housing such that the axes of said first and second preparatory chambers are disposed in a plane perpendicular to the axis of said rotor.

4,517,947
MULTIPLE CYLINDER ENGINE HAVING AIR-FUEL RATIO CONTROL MEANS IN ACCORDANCE WITH A SIGNAL FROM AN EXHAUST GAS SENSOR

Toshio Nishikawa; Tadashi Kaneko, and Kazutoshi Othuka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 8, 1982, Ser. No. 355,451
Claims priority, application Japan, Mar. 9, 1981, 56-34385
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—489 8 Claims



1. A multiple cylinder internal combustion engine including a first group of cylinder means, a second group of cylinder means, an intake system comprising main intake passage means, first intake passage means branched from said main intake passage means and leading to said first group of cylinder means, second intake passage means branched from said main intake passage means and leading to said second group of cylinder means, first fuel supply means for providing a supply of fuel to said first intake passage means, second fuel supply means for providing a supply of fuel to said second intake passage means, first exhaust passage means leading from said first group of cylinder means for passage of exhaust gas therefrom, exhaust gas sensing means including an oxygen concentration detecting means disposed in said first exhaust passage means for providing an output signal in accordance with the concentration of oxygen in the exhaust gas, first air-fuel ratio control means for controlling the first fuel supply means in accordance with the output of the exhaust gas sensing means so as to provide a first intake mixture of a first predetermined air-fuel ratio, second air-fuel ratio control means for controlling the second fuel supply means in accordance with the first predetermined air-fuel ratio to provide a second intake mixture of a second air-fuel ratio which is a predetermined relationship with respect to the first air-fuel ratio, mixing preventing means provided in said intake system upstream of said first and second fuel supply means for preventing said first and second intake mixtures from being mixed with each other due to pulsations in said intake system, and second exhaust passage means extending from said second group of cylinder means and merged with the first exhaust passage means, said first exhaust passage means being provided downstream of the exhaust gas sensing means with backflow preventing means.

4,517,948

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINES

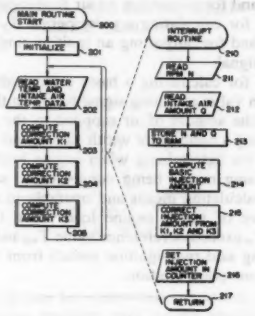
Yasumasa Kaji; Shigenori Isomura, both of Kariya; Takashi Harada, Hekinan, and Shuji Sakakibara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 21, 1983, Ser. No. 515,788

Claims priority, application Japan, Aug. 3, 1982, 57-134684

Int. Cl.³ F02M *17/00*

U.S. Cl. 123—489 **12 Claims**



1. A method for controlling an air-fuel ratio in an internal combustion engine, comprising the steps of:

setting correction data for feedback control so as to respectively correspond to operating states of the engine;

updating, upon detecting a given operating state, given correction data corresponding to the given operating state in accordance with an output signal from a combustion composition sensor;

computing an updated correction amount on the basis of all the correction data including the updated given correction data;

reflecting the updated correction amount in all the correction data so as to set correction data corresponding to a new operating state of the engine; and

reading the correction data respectively corresponding to the operating states of the engine in accordance with the new operating state so as to perform feedback control.

4,517,949

AIR FUEL RATIO CONTROL METHOD

Toshimitsu Ito, and Toshiaki Isobe, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 316,038, Oct. 28, 1981, abandoned. This application Mar. 21, 1984, Ser. No. 592,005

Claims priority, application Japan, Jan. 22, 1981, 56-8202

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—489 **9 Claims**

2. A method of learn-controlling an air-fuel ratio for an internal combustion engine, comprising the steps of:

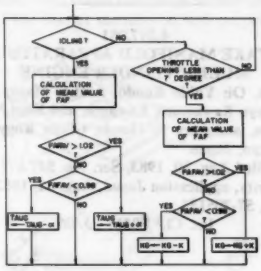
(a) calculating a basic fuel injection duration based on an engine load and a rotational speed of the engine;

(b) obtaining a factor of air-fuel ratio feedback correction for allowing a fuel injection duration to perform a proportional-plus-integral action, based on an output of an oxygen sensor for detecting an residual oxygen concentration in an exhaust gas;

(c) calculating a mean value of said factor of air-fuel ratio feedback correction;

(d) varying a correction value by learning so that said mean value takes a value within a predetermined range centered at a predetermined value corresponding to a target air-fuel ratio; and

(e) obtaining the fuel injection duration based on said basic fuel injection duration, said factor of air-fuel ratio feedback correction and said correction value, thereby, to control the air-fuel ratio.



4,517,950

METHOD AND DEVICE FOR CONTROLLING THE RECIRCULATION OF EXHAUST GAS IN A PRESSURE WAVE SUPERCHARGER FOR AN INTERNAL COMBUSTION ENGINE

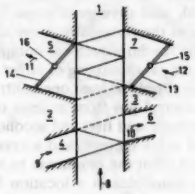
Andreas Mayer, Niederrohrdorf; Ibrahim El-Nashar, Kloten, and Fritz Spinnler, Liestal, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 3, 1983, Ser. No. 491,215

Claims priority, application Switzerland, Jun. 2, 1982, 3371/82

Int. Cl.³ F02B *33/42*

U.S. Cl. 123—559 **12 Claims**



1. Method for controlling the recirculation of exhaust gas in a pressure wave supercharger connected between an induction pipe and an exhaust pipe for an internal combustion engine, said supercharger including high pressure and low pressure exhaust gas ducts and high pressure and low pressure air ducts and, a butterfly valve provided in at least one of the ducts, comprising the steps of controlling the variation of the degree of recirculation as a function of the load condition of the internal combustion engine by altering the flow resistance in at least one of the low pressure ducts of the pressure wave supercharger.

5. Pressure wave supercharger for an internal combustion engine, comprising a device for controlling the recirculation of the exhaust gases, a rotor casing which accepts a rotor provided with cells through which gas flows axially, an air casing with an inlet flow duct for the induced air and an outlet flow duct for the compressed boost air, a gas casing with an inlet flow duct for the high pressure exhaust gases and an outlet flow duct for the exhaust gases, the inlet flow duct for the high pressure exhaust gases and the outlet flow duct for the boost pressure exhaust gases and the outlet flow duct for the boost air forming the high pressure side and the outlet flow duct for the exhaust gas and the inlet flow duct for the induced air forming the low pressure side of the pressure wave supercharger, a butterfly valve provided in at least one of the ducts of the low

pressure side and, an operating device for the control or regulation of the degree of recirculation being operatively connected with said butterfly valve.

4,517,951

INTAKE MANIFOLD APPARATUS IN MULTI-CYLINDER ENGINE

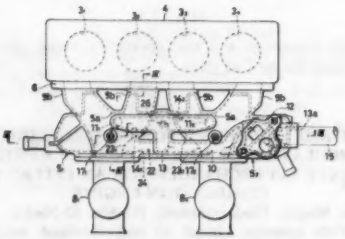
Shoichi Otaka, Oi; Yukio Kondo, Asaka; Masayuki Kumada, Tokyo; Hideyo Kawamoto, Kawagoe, and Keiji Miura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,871

Claims priority, application Japan, Aug. 31, 1982, 57-150002; Nov. 22, 1982, 57-205131

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—572 **11 Claims**



1. In a plural cylinder internal combustion engine which includes a crankcase, a first and a second independent air-fuel gas generating means, first and second intake manifolds each including a first area to which a respective air-fuel gas generating means is mounted and a second area where divergent flow paths are provided, said divergent paths being downstream from the first area in the flow path of the air-fuel gas toward the engine, wherein the improvement comprises:

a source of control gas consisting of either engine exhaust or an auxiliary air supply at least one control gas passage for feeding said control gas from at least one source of said control gas to both said first and second intake manifolds at said second areas thereof, and a crankcase vapor passage connected from the crankcase to both said first and second intake manifolds at a location between said first and second areas thereof downstream from said first areas.

4,517,952

TWIN IGNITION PLUG CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

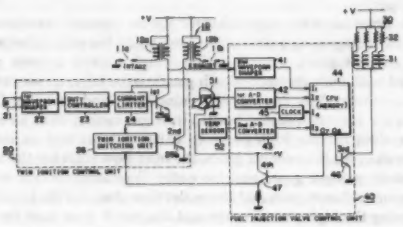
Katsumi Hosoya, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 10, 1982, Ser. No. 440,533

Claims priority, application Japan, Jan. 13, 1982, 57-2123[U]

Int. Cl.³ F02P *15/08*

U.S. Cl. 123—638 **13 Claims**



1. A twin ignition plug control system for controlling first and second ignition coils respectively supplying ignition energy to first and second ignition plugs which are respectively disposed on an intake port side and an exhaust port side of a cylinder of an engine having a crankshaft, the control system comprising:

(a) means for timing ignition energy to the first and second ignition coils in accordance with angular positions of said crankshaft and for outputting ignition signals, said timing means including a twin-ignition switch for switching between two-point ignition and one-point ignition;

(b) means for detecting an amount of air supplied to the engine and for outputting an air flow quantity signals;

(c) means for calculating a pulse period T_p of the ignition signals and for outputting an ignition timing signal pulse period signal;

(d) means for calculating a basic pulse width T_w of a fuel injection valve actuating signal based on the pulse period T_p and the amount of air supplied to the engine and for outputting a basic pulse width signal; and

(e) means for determining when engine load is heavy, said determining means being connected to said basic pulse width calculating means and operable to output a signal indicative of heavy engine load when the basic pulse width T_w exceeds a reference value T_{wo} and for thereupon switching said twin-ignition switch from two-point ignition to one-point ignition.

4,517,953

BALL THROWING MACHINE

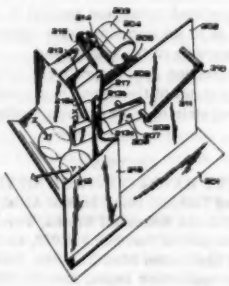
Takatoshi Osaka; Katsuo Nishimura, and Tadahiko Nakagiri, all of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,125

Claims priority, application Japan, May 6, 1982, 57-66097[U]; May 31, 1982, 57-80190[U]; May 31, 1982, 57-80189[U]; Oct. 1, 1982, 57-149930[U]

Int. Cl.³ F41B *7/00*

U.S. Cl. 124—17 **2 Claims**



1. A ball throwing machine comprising:

(a) a drive motor connected to a power source;

(b) a reduction machanism for reducing the rotating speed of said drive motor;

(c) a one-way clutch mechanism connected to said reduction mechanism;

(d) a shaft for transmitting the rotating force of the motor through said clutch mechanism;

(e) a ball hitting lever fixed to said shaft;

(f) a spring mechanism for imparting a pivoting force to said hitting lever;

(g) a switch for making and breaking an electric current to said motor;

(h) a safe detecting member for detecting a foreign object; and

(i) means for causing said safe detecting member to actuate

said switch to break said power source upon detection of the foreign object, said safe detecting member being a lock cover which is movably positioned adjacent the rotation trace of said hitting lever.

4,517,954

REMOVABLE MOUNT FOR CUTTING MEANS

Peter T. deKok, Fulton County, and John Phildius, Gwinnett County, both of Ga., assignors to Gran-Quartz Trading, Inc., Decatur, Ga.

Filed Jan. 3, 1983, Ser. No. 455,214
Int. Cl.³ B28D *1/04*
U.S. Cl. 125—15 **2 Claims**

1. Mounting means for removably mounting cutting elements on a cutting machine, said cutting machine having a cutting edge movable in at least one direction for cutting material, said cutting edge being movable into a kerf in the material being cut, and a plurality of cutting elements distributed along said cutting edge for performing the cutting, each cutting element of said plurality of cutting elements comprising a base member fixed to said cutting edge, a cap member selectively fixable to and removable from said base member, and a cutting segment fixed to said cap member, characterized in that said base member has a width generally equal to the width of said kerf, and said cap member has a width generally equal to the width of said kerf, said base member has a rear surface fixed to said cutting edge of said cutting machine, and a front surface longer than said rear surface so that end surfaces of said base member diverge and cause said base member to have a dovetail shape, said cap member defines an opening therethrough for receiving said base member, said opening being substantially the same size and shape as said dovetail shape, the arrangement being such that said cap member is receivable on said base member by motion transverse to said at least one direction, and further including securing means for selectively securing said cap member to said base member, said cap member defining hook members at each end of said opening, said hook members engaging said end surfaces of said base member, said hook members mechanically locking said cap member to said base member against motion of said cutting edge of said cutting machine, and securing means including a pin received between one of said hook members and the adjacent end surface for preventing transverse motion of said cap member with respect to said base member.

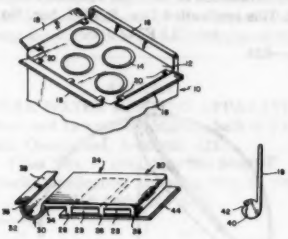
4,517,955

STOVE SAFETY GUARD

Conrad P. Ehrlich, and Sandra L. Ehrlich, both of 1243 Beacon St.; 3B, Brookline, Mass. 02146

Filed Nov. 14, 1983, Ser. No. 550,823
Int. Cl.³ F24C *15/10*
U.S. Cl. 126—211 **19 Claims**

1. A barrier system for the top of a range along one or more sides thereof comprising for each side a barrier member, support means for the barrier member, means for detachably attaching the support means to the range, hinge means supported by the support means adjacent the top and parallel to the side to which the barrier is to be mounted, complementary hinge means at one longitudinal edge of the barrier member for rotatably receiving the hinge means supported by the support means for rotation of the barrier member about an axis parallel to the side of the range from a position perpendicular to the top to a substantially horizontal position, interengageable latch means associated with respective hinge means interengageable by rotation of the barrier member to said perpendicular posi-



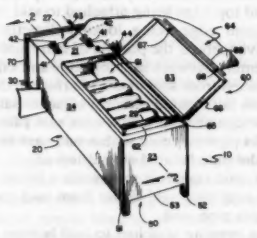
tion to lock the barrier member in said perpendicular position, said latch means being manually disengageable to release the barrier member to permit it to be rotated to said substantially horizontal position and means at said horizontal position of the barrier member to support it in said horizontal position.

4,517,956

WOODBOX

Walter F. Baker, 2108 Randolph Cir., Kennesaw, Ga. 30144

Filed Sep. 6, 1983, Ser. No. 529,545
Int. Cl.³ F24B *1/08*; A47B *81/00*
U.S. Cl. 126—283 **6 Claims**



1. A wood box for installation into an enclosed structure having an exterior wall, comprising:

a housing including top, bottom, side and rear surfaces, said top, bottom and side surfaces partially extending through said exterior wall of the enclosed structure thereby defining a retrieval opening in said housing opening to the interior of the enclosed structure, and said top surface defining a load opening therein outside of the enclosed structure;

a vertical flange extending upwardly from said top surface and surrounding said load opening;

a removable cover including a continuous downwardly extending cover side wall, said cover enveloping said vertical flange when said cover is in a closed position; and

a movable drawer assembly including a drawer comprising floor, back and side walls shaped to be received within said retrieval opening, and a face plate extending laterally outwardly beyond said retrieval opening, said movable drawer assembly including means for slidably mounting said drawer for movement between a closed position in which said drawer is located below said load opening and said face plate engages said top, bottom and side surfaces of said housing, and an open position in which the drawer is accessible to the interior of said structure.

4,517,957

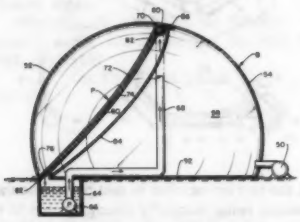
INFLATION SUPPORTED SOLAR COLLECTOR

Ronald L. Pelley, 4032 Montego Dr., Huntington Beach, Calif. 92649

Division of Ser. No. 346,519, Feb. 8, 1982, Pat. No. 4,422,445, which is a continuation of Ser. No. 154,808, May 30, 1980, abandoned. This application Dec. 5, 1983, Ser. No. 542,690

Int. Cl.³ F24J 3/02

U.S. Cl. 126—426 2 Claims



1. A solar energy collecting apparatus comprising:

a thin, flexible walled housing;

an air blower connecting to said housing, said air blower to inflate said housing forming a rigid walled structure, with said housing located on a supportive surface said housing forming a totally enclosed chamber, said rigid walled structure having an interior surface and an exterior surface, said interior surface defining the extremity of said totally enclosed chamber;

a film assembly mounted within said totally enclosed chamber, said film assembly having a front surface and a rear surface, said film assembly having a top edge and a bottom edge, said top edge being attached to said interior surface, said bottom edge being located directly adjacent said supportive surface, the portion of said front surface of said film assembly between said top edge and said bottom edge being spaced from said interior surface, a dead air insulating region lay located directly adjacent said rear surface, a narrow chamber formed within said film assembly;

a liquid inlet pipe mounted within said narrow chamber, said liquid inlet pipe located at said top edge;

a reservoir, said reservoir to contain a liquid;

means for supplying said liquid from said reservoir to said liquid inlet pipe; and

a discharge opening attached to said bottom edge connecting with said narrow chamber, said liquid to be conducted through said inlet pipe into said narrow chamber and through said discharge opening into said reservoir.

4,517,958

HEAT EXCHANGE SYSTEM

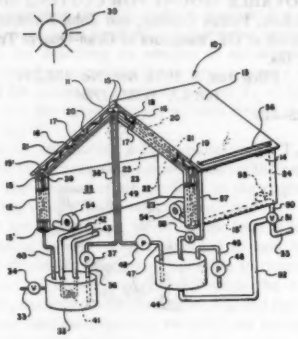
Douglas L. Worf, 109 Perth Ct., Cary, N.C. 27511

Division of Ser. No. 190,665, Sep. 25, 1980, Pat. No. 4,408,596. This application Dec. 20, 1983, Ser. No. 538,334

Int. Cl.³ F24J 3/02

U.S. Cl. 126—429 1 Claim

1. A dual fluid flow corrugated type solar panel assembly designed for solar efficiency but which inherently provides substantial structural integrity, comprising in combination: a corrugated panel extending substantially across said solar panel assembly; said corrugated panel forming a first fluid flow compartment for receiving a first fluid medium and directing the same through said solar panel assembly; means associated with said corrugated panel and first fluid flow compartment for guiding and directing said first fluid medium over said corrugated panel and through said solar panel assembly in a first direction; means operatively associated with said first fluid flow compartment for directing fluid to and from said fluid flow compartment; a second air flow compartment formed adjacent said first fluid flow compartment, said second air flow compartment adapted to receive and transfer air therethrough; means operatively associated with said air flow compartment for transferring air to and from said second flow compartment; a boundary panel spaced from said corrugated panel and extending substantially across said solar panel assembly for forming the boundary of said second air flow compartment; means associated with said air flow compartment for directing air



therethrough in a second direction at an angle of generally ninety degrees relative to the flow of said first fluid medium passing through said first fluid flow compartment such that the air and first fluid medium flow at a generally ninety degree angle with respect to each other; and transparent means operatively associated with said solar panel assembly for allowing solar energy to be transferred thereto.

4,517,959

JACKETED SOLAR HOT WATER SYSTEM

Harry J. Riley, Wembley, Australia, assignor to S. W. Hart & Co. Pty Ltd., Welshpool, Australia

Filed Sep. 29, 1982, Ser. No. 426,382

Claims priority, application Australia, Mar. 10, 1982, PF3048

Int. Cl.³ F24J 3/02

U.S. Cl. 126—437 7 Claims

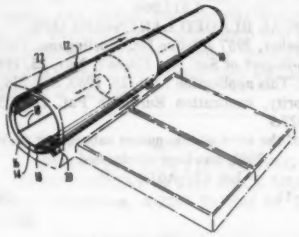
1. A tank assembly for a solar hot water system comprising a solar collector for containing a working fluid, said tank assembly comprising

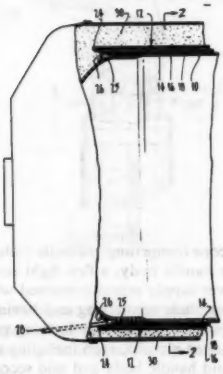
(a) a cylindrical tank having water inlet and outlet means for containing water to be heated;

(b) a jacket in the form of an annular sealed envelope having inner and outer major walls, said jacket at least partly enclosing said cylindrical tank and defining an enclosed space for also containing said working fluid;

(c) means arranged to form a closed fluid circuit between said collector and said enclosed space; and

(d) an annular air gap adjacent each end of said envelope between said inner wall thereof and said tank, said air gap





being sealed by an annular seal and being vented to atmosphere.

4,517,960

PROTECTION DEVICE AGAINST SOLAR LIGHT

Christian Bartenbach, Rinnerstrasse 39, A-6020 Innsbruck-Aldrans, Austria

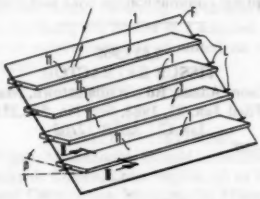
PCT No. PCT/DE82/00204, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. WO83/01122, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 20, 1982, Ser. No. 504,058

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138262; Jul. 16, 1982, 3226709

Int. Cl.³ F24J *3/02*; G02B *27/00*

U.S. Cl. 126—440 **5 Claims**



1. A solar protection device, comprising: screening means for screening out for a substantial portion of a day direct solar rays from the sun in a narrow screening zone of solar ray angular incidence while simultaneously admitting ambient daylight, said screening means comprising a plurality of slats made of light-permeable material and having a flat non-reflective base surface on a first side facing the sun and a prismatic structure on a second side facing away from the sun; said slats being arranged in side-by-side relationship in a window opening so as to be rotatable about respective parallel longitudinal axes; and the prismatic structure comprising at least one prismatic rod of triangular cross-section with two outside non-reflective planar faces, a longitudinal axis of the rod running parallel to the longitudinal axis of the slat and said two side faces enclosing between them an apical angle of 90°.

4,517,961

SOLAR WATER HEATING APPARATUS

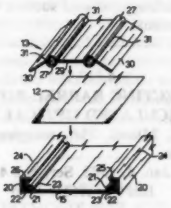
Trevor J. Bloor, and Lawrence J. Walton, both of P.O. Box 388, Broadbeach, Queensland, Australia 4217

Filed Nov. 7, 1983, Ser. No. 549,594

Claims priority, application Australia, Nov. 9, 1982, PF6712

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **11 Claims**



1. Solar water heating apparatus including an inlet header and an outlet header communicating through at least one solar absorber assembly, said absorber assembly including an extruded base member formed of flexible plastics material, said base member having a substantially planar floor portion, means integral with said base member for supporting said floor portion above a sun exposed supporting surface whereby said base member is in minimum heat conducting contact with said support surface; an extruded ducting member formed of flexible plastics material; means integral with said ducting member for supporting said ducting member above said floor portion of said base member, said ducting member including at least one integrally formed fluid conducting passageway extending longitudinally therethrough, said passageway interconnecting said inlet and outlet headers whereby water flowing into said inlet header passed through said passageway and into said outlet header, and an elongated glazing member operatively associated with said base member and supported above said floor portion of said base member to define therewith a hollow space surrounding said ducting member.

4,517,962

NASAL ENDOSCOPES

Helmut Heckele, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,808

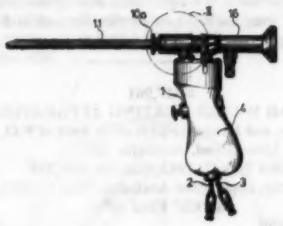
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 8136066[U]

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **2 Claims**

1. An endoscope for endonasal surgery, having a handle with a distal and a proximal end, said handle traversed by flushing and suction passages and carrying a projecting flushing and suction shaft extending from said distal end of said handle, an optical system extending through said shaft, wherein said handle is provided with a quick disconnect cou-

pling means for interchanging from said proximal end of said handle one of a plurality of different flushing and suction shafts each having an optical system associated therewith, said flushing and suction shafts each having complimentary coupling



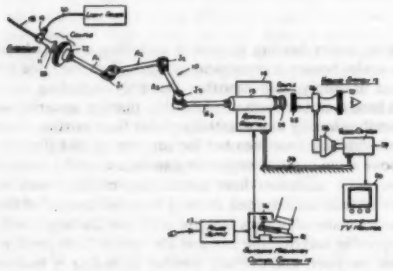
means mating with said quick disconnect coupling means, said flushing and suction shaft being in fluid-tight communication with said passages extending through said handle when said handle and said flushing and said suction shaft are connected by said coupling means.

4,517,963

IMAGE-ERECTING BARREL ROTATOR FOR ARTICULATED OPTICAL ARM

Thomas J. Michel, Miami, Fla., assignor to Harold Unger, Miami Beach, Fla.

Filed Jan. 4, 1983, Ser. No. 455,575
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **9 Claims**



1. In combination, an articulated optical arm adapted to optically link to a viewing station the eyepiece of an endoscopic telescope which views an internal region, said arm including a series of sections mechanically interhinged and optically intercoupled by joints, a rotatable image-erecting barrel and a terminal eyepiece, the last section in the series being optically coupled through said rotatable image-erecting barrel to said terminal eyepiece, said arm being adjustable by an operator so that the endoscope may be extended, retracted or otherwise adjusted with respect to the internal region whereby any aspect of the internal region may be clearly viewed at the viewing station, the image transmitted through the arm undergoing circumferential displacement about the optical axis in a direction and to a degree that depends on this adjustment, and a barrel rotator comprising:

A. a primary assembly provided with a sleeve which telescopically receives and clamps onto said barrel and including a bi-directional motor operatively coupled to said sleeve to rotate the barrel either in the clockwise or counterclockwise direction, depending on the polarity of power supplied thereto; and

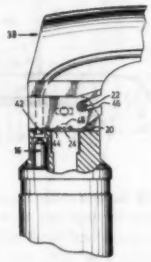
B. a remote control station connected to the primary assembly and including selective means to supply power to the motor in a polarity and for a period effecting turning of the barrel in a direction and to an extent causing erection of the image presented through said terminal eyepiece.

4,517,964

DUAL BLADED LARYNGOSCOPE

Michael S. Upsher, 2957 Adeline Dr., Burlingame, Calif. 94010

Continuation-in-part of Ser. No. 324,887, Nov. 25, 1981, Pat. No. 4,437,458. This application Mar. 25, 1983, Ser. No. 478,850
Claims priority, application European Pat. Off., Nov. 27, 1980, 80 107427.9
The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—11 **14 Claims**



1. A laryngoscope comprising: a handle including an electrically conductive handle body, a first light source carried on said body, a power supply means contained within said body, and an uppermost blade connecting end having first and second electrical contacts respectively forming parts of separate first and second open circuits, each including said power supply means and said handle body and said second open circuit including said first light source; a first blade carrying a second light source and means for mounting the first blade to the blade connecting end of said handle in a way which causes said first blade to engage said first contact without engaging said second contact for placing said second light source in circuit with said first open circuit and for closing said first open circuit whereby said power supply means energizes said second light source carried by said first blade while said first light source remains off; and a second blade carrying a light guide and having an electrically conductive base for mounting the second blade with the blade connecting end of said handle in a way which causes said second blade to engage said second contact without engaging said first contact for closing said second open circuit through the electrically conductive mounting base of said second blade whereby said power supply means energizes said first light source carried by said handle while said light guide is placed in optical communication with said first light source.

4,517,965

TISSUE RETRACTOR

Arthur E. Ellison, Adams Rd., Williamstown, Mass. 01267

Filed Jun. 27, 1983, Ser. No. 508,251
Int. Cl.³ A61B *17/02*
U.S. Cl. 128—20 **5 Claims**

1. A tissue retractor for use during arthroscopic surgery on the knee joint comprising:

a hollow sheath;

a rod slidingly contained within said sheath; and a barb

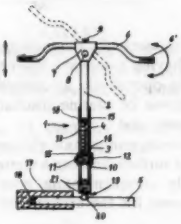
member including a slanted edge, said barb member attached to said sheath near an end of said sheath, said barb member remaining in a retracted position flush with said sheath until said rod is advanced into said sheath and engages said slanted edge thereby forcing said barb to project laterally beyond said sheath into an erect operating position, said barb member fabricated of a spring material so that it will retract flush with said sheath when said rod is retracted.

4,517,966

APPARATUS FOR STRETCHING AND STRENGTHENING THE BACK MUSCLES

Achim von Othegraven, A-2203 Putzing 68, Putzing, Austria (A-2203)

Filed Oct. 21, 1982, Ser. No. 435,543
Claims priority, application Austria, Oct. 23, 1981, 4541/81
Int. Cl.³ A63B *23/02, 21/00*
U.S. Cl. 128—75 **4 Claims**



1. A gymnastic apparatus for stretching and strengthening the back muscles, which comprises

(a) a substantially rectilinearly extending support bar having two ends,

(b) a telescopic back tensioning bar having an axis and forming a T-shape with the support bar, the back tensioning bar comprising

(1) two telescoping members extending along said axis, one of the telescoping members being a tube and the other telescoping member being a rod extending into the tube and rotatable in relation thereto about the axis of the back tensioning bar, the support bar being connected to the one telescoping member, and

(2) a compression spring biasing the other telescoping member in a direction away from the support bar,

(c) a handle bar at an end of the other telescoping member remote from the one telescoping member, the handle bar being farther spaced from the support bar when the spring is uncompressed than when it is compressed,

(d) a holder attached to the end of the other telescoping member, the holder receiving the handle bar,

(e) means for fixing the holder in a selected position, and

(f) a support sleeve rotatably mounted on each end of the support bar.

4,517,967

PENILE PROSTHESIS

Gerald W. Timm, Minneapolis; Donald L. Sandford, Lauderdale, and Timothy J. Claude, Coon Rapids, all of Minn., assignors to Dacomed Corporation, Minneapolis, Minn.

Filed Apr. 18, 1983, Ser. No. 485,647
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—79 **9 Claims**

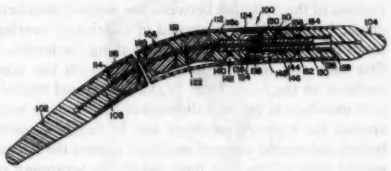
1. A penile prosthesis having first and second ends for implantation in a penis, comprising:

a. an outer elongated sheath formed from a physiologically inert and pliable material and fixedly secured proximate the first and second ends of the prosthesis;

b. an articulated column of segments having slidable joints therebetween and enclosed within said sheath;

c. tension means including an elongated tension member having first and second ends and extending longitudinally of the prosthesis, the tension member being secured proximate its first and second ends to proximate the respective first and second ends of the prosthesis; and

d. axially elongatable and shortenable switch means enclosed within said sheath and axially disposed intermediate of said articulated column and the first end of the prosthesis for switching the prosthesis between a flaccid state and a rigid state, said switch means cooperating with said tension member and said articulated column for increasing the tension of said tension member and compressing the articulated column when axially elongated by a user, whereby the frictional resistance of said joints of said articulated column is increased, thereby imparting rigidity to the prosthesis.

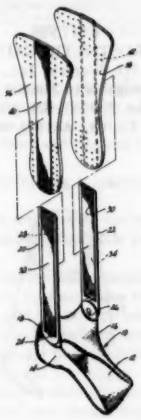


4,517,968

COMPOSITE ORTHOSIS FOR ANKLE SPRAINS AND THE LIKE

Ted J. Greene, La Canada, and George P. Irons, West Covina, both of Calif., assignors to United States Manufacturing Company, Pasadena, Calif.

Filed Apr. 13, 1983, Ser. No. 484,484
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 H **4 Claims**



1. A composite orthosis for use in immobilizing a rotational joint comprising:

elongated semi-rigid lateral and medial support members extending along lateral and medial sides of a first limb adjacent a rotational joint;

a brace secured to a second limb on an opposite side of the joint;

means hinging the lateral and medial support members to the brace so the support members can pivot relative to the brace about an axis through the joint, front and rear open

regions being left along the front and rear of the first limb between the support members;

resilient lateral and medial padding and means for attaching the padding to the inside faces of the lateral and medial support members so the resilient padding overlies the lateral and medial sides of the first limb;

non-skid surfaces on the outer faces of the lateral and medial support members; and

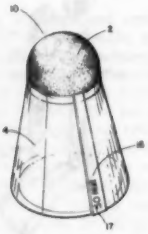
a self-adherent elastic bandage wrapped around the lateral and medial support members and the front and rear open regions of the first limb between the support members, the elastic bandage being wrapped in a series of overlapping loops from the vicinity of the joint along the length of the first limb and into frictional contact with the non-skid surfaces on the outer faces of the lateral and medial support members to prevent slippage of the bandage wrapped around the support members and to firmly support the lateral and medial support members against the lateral and medial sides of the first limb, while the wrapping of the elastic bandage provides the means of support along the front and rear of the first limb between the lateral and medial support members, the lateral and medial support members and the brace cooperating for immobilizing the joint against lateral and medial mobility, the pivot means and the wrapping of the elastic bandage along the front and rear of the first limb allowing rotational mobility of the limb about the joint axis, while providing resistance to twisting of one limb relative to the other.

4,517,969

PROSTHETIC GAUGE

F. Joseph Halcomb, III, Warsaw, Ind., and C. Wayne Allen, Memphis, Tenn., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Mar. 3, 1983, Ser. No. 471,967
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 E 9 Claims



1. A prosthetic gauge used for evaluating the fit of a prosthetic device against a receiving bone or cartilage surface comprising:

a means for gripping; and

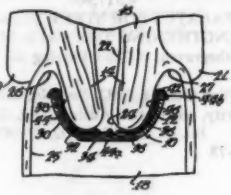
a contact portion extending from said gripping means, said contact portion having a translucent surface, and wherein said contact portion is contoured to correspond to the surface of the prosthetic device which is to mate with the receiving bone or cartilage surface being evaluated.

4,517,970

CONFORMING VALVED CERVICAL CAP ASSEMBLY AND IN-SITU MOLDING METHOD

Robert A. Goepp, Chicago; Uwe E. Freese, Oak Park, and Marvin P. Loeb, Chicago, all of Ill., assignors to University Patents, Inc., Westport, Conn. and Contracap, Inc., Schaumburg, Ill.

Division of Ser. No. 207,904, Nov. 18, 1980, Pat. No. 4,401,534.
This application Jul. 1, 1983, Ser. No. 510,278
Int. Cl.³ A61F 5/46
U.S. Cl. 128—131 18 Claims



1. A cervical cap assembly, comprising:

a flexible shell having a concave inner surface and one-way valving means operatively associated with said shell for permitting egress of uterine discharges but preventing ingress of sperm; and

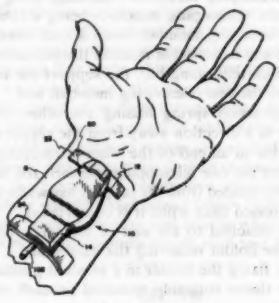
a liquid impervious, non-porous elastomeric lining on said concave inner surface defining a wettable, matingly fitting and resiliently complementing contact surface permanently contoured for the exocervical surface of a cervix uteri.

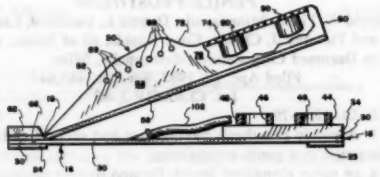
4,517,971

GUARD FOR VENIPUNCTURE SITE AND CATHETER RETAINER

Robert L. Sorbonne, 2466 Michigan Ave., Salt Lake, Utah 84108

Filed Nov. 22, 1982, Ser. No. 443,271
Int. Cl.³ A61M 5/00
U.S. Cl. 128—133 5 Claims





1. A venipuncture guard for a medical patient comprising:

generally flat skin-engaging base means, the base means comprising an opening accommodating placement of the base means around a venipuncture site;

lid means comprising means bridging over the venipuncture site in spaced relation thereto comprising means for successively opening and means for closing the lid means in respect to the base means to permit access to the venipuncture site and conceal the site from debris and prevent inadvertent displacement of an intravenous cannula in respect to the vein of a patient at the venipuncture site, respectively;

the guard further comprising means defining passageway means by which medical tubing spans between the venipuncture site and the exterior of the guard;

the guard further comprising vein bridge means in aligned though axially spaced relation to the venipuncture site which vein means prevents occlusion by the guard of the vein in which the venipuncture site is disposed; and

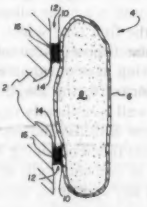
anti-displacement means, associated with the vein bridge means, which prevent inadvertent removal of an indwelling cannula from the venipuncture site.

4,517,972

METHOD AND APPARATUS FOR APPLYING A THERAPEUTIC ARTICLE TO A BODY

Robert E. Finch, Jr., 326 N. Seventh St., Suite 204, Springfield, Ill. 62701

Filed Jan. 11, 1983, Ser. No. 457,249
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—156 **5 Claims**



1. Apparatus for applying a thermal treatment to the body of an animal comprising

(a) thermal treatment means for producing a temperature higher or lower than the skin temperature of said animal, and

(b) attachment means for securing said article to said body comprising an elongate strip having adheaive thereon for securing said strip to said body and a second surface for cooperating with a surface of said thermal treatment means,

(c) said surface of said thermal treatment means comprising removable attachment means for engaging said second surface to removably attach said thermal treatment means to said animal, said removable attachment means having a width substantially larger than the width of said elongate strip.

4,517,973

LASER SCALPEL

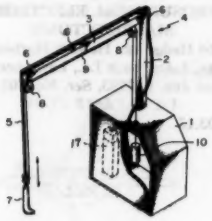
Katsuyoshi Sunago, and Shinya Takenaka, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1982, Ser. No. 395,306
Claims priority, application Japan, Jul. 7, 1981, 56-100113[U]
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **12 Claims**

1. A laser scalpel using an optical fiber for an optical wave guide said optical fiber being guided from a laser main body, housing a laser source therein, to areas to be irradiated by said laser scalpel, wherein:

shore means provided on the laser main body for guiding said optical fiber, said optical fiber being provided with a hand piece on the exterior of one end thereof,

said hand piece facilitating directing of the one end of said fiber toward the areas to be irradiated, and



a supporting wire means, provided along said shore means, for permitting axial movement of itself along the lengthwise axis of said shore means, a forward end of said wire means being connected to said hand piece and a rear end of said wire means being connected to a balancing means for counter-balancing at least the weight of said hand piece.

4,517,974

DISPOSABLE HAND PIECE FOR SURGICAL LASERS

Howard M. C. Tanner, Salt Lake City, Utah, assignor to HGM, Inc., Salt Lake City, Utah

Filed Oct. 28, 1982, Ser. No. 437,289
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **2 Claims**

1. A disposable hand piece for controlling and directing the application of a laser beam produced by a laser powered by an electrical power source and transmitted through an optical fiber connected to said laser and encased in a sheath, comprising:

(a) an elongated body having a leading end and a trailing end, comprising:

(i) a plastic molded top portion having a pair of opposed resiliently outwardly biased side panels at the leading end thereof;

(ii) a plastic molded bottom portion having a pair of notches formed in opposed sides thereof for receiving said side panels, said top portion being shaped to nest in said bottom portion behind the leading end thereof;

(iii) said top and bottom portions being secured together to form said body and providing:

(aa) a bore extending through said body, said optical fiber encased by said sheath being mounted in said bore;

(bb) a cavity within said body intermediate the length thereof; and

(cc) in a leading portion of said bottom portion forward of said cavity, means anchoring the leading end of said optical fiber encased by said sheath; and

(b) a pressure-sensitive switch mounted in said cavity between said panels and including electrical contacts positioned for being actuated by depressing either of said panels inwardly while holding said hand piece; and

(c) electrical leads extending from said switch through said

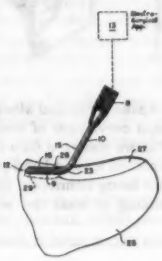
sheath encasing said optical fiber and branching from said sheath to said power source enabling said laser beam to be switched on and off by means of depressing either of said panels to actuate said switch while holding said hand piece.

4,517,975

ELECTROSURGICAL ELECTRODE FOR MATRISECTOMY

Jon C. Garito, 264 Hedge La., Hewlett Harbor, N.Y. 11577, and Alan G. Ellman, 1 Auerbach La., Lawrence, N.Y. 11516

Filed Jun. 6, 1983, Ser. No. 501,408
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.13 **8 Claims**



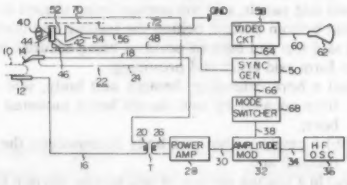
1. An electrosurgical electrode comprising an elongate one-piece metal member having at one end means for mounting same in a handpiece and at the opposite end a working tip for delivering high frequency currents to animal tissue, said working tip having a thin flat spade-shaped end, and a thin insulating resin coating extending over one flat side of the spade-shaped end leaving the opposite side bare, said coating preventing transfer of high frequency currents to the tissue while allowing such transfer from the bare flat side, said metal member being constituted of a bendable malleable metal allowing bending of the member as well as of the tip by the user to adapt same to the tissue being treated.

4,517,976

HIGH FREQUENCY SCALPEL AND ENDOSCOPE SYSTEM AND METHOD OF OPERATING SAME

Makoto Murakoshi, Asaka, and Takahiro Ota, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1982, Ser. No. 424,769
Claims priority, application Japan, Oct. 20, 1981, 56-167567
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.15 **15 Claims**



1. A high frequency scalpel system usable with a video imaging system developing a video signal comprising:

an electrode functioning as a surgical knife;

high frequency current supplying means for supplying said electrode with a high frequency current; and

synchronous generator means for producing a synchronous signal which defines horizontal blanking periods in a raster scanning-type video signal;

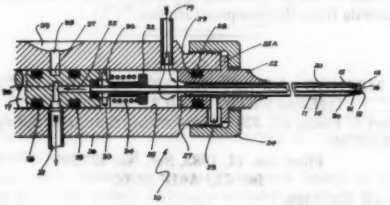
control means for enabling said high frequency current supplying means in response to the synchronous signal developed by said synchronous generator means so as to supply said electrode with the high frequency current primarily during a horizontal blanking period of the video signal.

4,517,977

CO-AXIAL TUBE SURGICAL INFUSION/SUCTION CUTTER TIP

Richard B. Frost, Eastwood, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Jul. 24, 1981, Ser. No. 287,745
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **4 Claims**



1. A surgical instrument comprising a first tube having at one end an end wall disposed in a plane substantially normal to the longitudinal axis of the first tube which end wall contains an aperture; a second tube disposed substantially coaxially within the first tube and having at one end an end wall disposed in a plane substantially normal to the longitudinal axis of the second tube which end wall is resiliently urged by resilient means into close juxtaposition with the end wall of the first tube; the end wall of said second tube containing an aperture; said apertures extending only in said end walls so that the side walls of said tubes are free of any apertures; means to enable the tubes to be rotated relative to one another about their common axis, the apertures in the end walls of the tubes each lying wholly within the plane of its associated end wall and the apertures being so placed in the end walls that they are moved into register and substantially completely out of register with one another as the tubes are rotated relative to one another; annular duct means defined between the first tube and the second tube discharging at said one ends of the tubes to direct a stream of a liquid to said one ends of the tubes; and duct means to connect the interior of the second tube to a source of suction, an edge portion of each aperture being sharpened such that the edge portions together form cooperating shearing blades as the apertures are moved out of register.

4,517,978

BLOOD SAMPLING INSTRUMENT

Paul D. Levin, 1595 Soquel Dr., Santa Cruz, Calif. 95065, and John D. Harding, 228 Fern St., Santa Cruz, Calif. 95060

Filed Jan. 13, 1983, Ser. No. 442,600
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—314 **5 Claims**

1. A blood sampling instrument designed to be hand held by an operator and being adapted to prick a finger or the like of a patient to draw a few drops of blood, said instrument having a distal end toward a patient and a proximal end toward an operator, comprising in combination:

(a) a tubular member having a hollow nosepiece at the distal end with an aperture at the terminal end thereof and a spring chamber at the proximal end,

(b) an annular collar having a shoulder at the proximal end

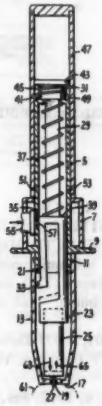
thereof and an annular flange immediately behind said nosepiece at the distal end of said collar,

(c) a hollow sleeve surrounding said spring chamber,

(d) a plunger mounted for reciprocation within said tubular member,

(e) a shoulder within said tubular member, a main spring mounted within said spring chamber, said shoulder engaging said spring and biasing said plunger toward said nosepiece,

(f) a socket and a needle mounted therein on the distal end of said plunger,



(g) an aperture on the side of said tubular member, a finger on said plunger to engage said aperture and hold said plunger when said plunger is drawn away from said nosepiece,

(h) a trigger button extending from said collar and having means to engage the finger on said plunger,

(i) plunger cocking means on said sleeve to pull said plunger away from said nosepiece and engage said finger whereby

(j) the nosepiece of said instrument can be pressed against a finger by exerting pressure on said flange while pressing said trigger to release said plunger and cause said needle to be driven out of said nosepiece.

4,517,979

DETACHABLE BALLOON CATHETER

Frank Pecenka, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 14, 1983, Ser. No. 513,697
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—325 **6 Claims**

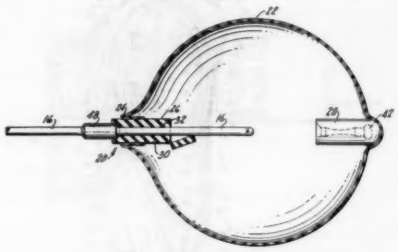
1. A detachable balloon catheter assembly for use in human vessels comprising:

a small diameter cylindrical cannula having a distal end and a proximal end having connector terminal means on the proximal end for coupling the cannula to a source of fluid pressure;

a sealing valve assembly including a body member having a cylindrical passageway extending therethrough adapted to receive the distal end of said cannula thereby to provide a fluid tight seal against the outer surface of said cannula, said sealing valve assembly also including a valve means operative to permit the passage of said cannula through said valve assembly but preventing the flow of fluid through said valve assembly when said cannula is withdrawn from said valve assembly;

an inflatable balloon including a mouth portion at one end thereof, said mouth portion of the balloon being disposed about said sealing valve assembly;

retainer means including a body portion formed of a resilient material having a cylindrical cavity extending into said body portion, said cylindrical cavity of said retainer mean normally being of a diameter smaller than the outside diameter of said cannula so as to frictionally engage the outer surface of said cannula when said cannula is inserted into said cavity of said retainer means so that a predetermind force is required to withdraw said cannula from said retainer means, and said retainer means being affixed to the inside surface of said balloon at a position diametri-



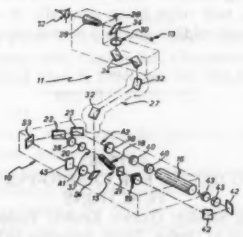
cally opposite to the mouth of the balloon said retainer means having means for permitting pressurized fluid supplied to the distal end of said cannula, when it is positioned at the inner end of said cavity, to escape from said retainer means into said balloon and when said balloon becomes inflated the distal end of the cannula can be withdrawn from said retainer means and said valve assembly thereby to cause the balloon to become detached from the cannula.

4,517,980

OPHTHALMIC SURGICAL LASER APPARATUS

Luc Tagnon, Saint Mande, France, assignor to Essilor International Cie Generale d'Optique, Creteil, France

Filed Sep. 30, 1982, Ser. No. 429,962
Claims priority, application France, Oct. 2, 1981, 81 18612
Int. Cl.³ A61N *5/00*; A61B *17/36*
U.S. Cl. 128—395 **12 Claims**

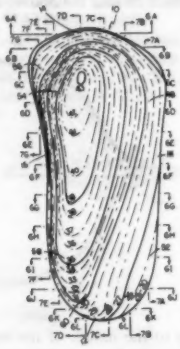


1. An ophthalmic surgical apparatus comprising a main laser genrator for emitting an operating laser beam of infrared energy and an auxiliary marker laser for emitting a marker laser beam of visible light, means for superposing the laser beams of the operating laser and the auxiliary marker laser before reaching an operating optical system, said means for superposing the laser beams of the operating laser and the auxiliary marker laser including a plurality of mirrors and a laser beam expander for expanding each of the laser beams, said laser beam expanders each having separate entrance lenses and sharing a common exit lens.

4,517,981
ORTHOTIC DEVICE

Frank J. Santopietro, 6 Calvin Rd., Jamaica Plain, Mass. 02130, and Thomas V. Santopietro, Jr., 9 Chestnut Hills Ct., Greenville, R.I. 02828

Filed Jun. 8, 1983, Ser. No. 502,208
Int. Cl.³ H61F 5/14
U.S. Cl. 128—581 11 Claims



1. An improved orthotic device for supporting a human foot in a substantially correct anatomical position, said device including a forefoot portion, a rearfoot portion and opposing medial and lateral sides, said medial and lateral sides being disposed on opposing sides of a midline extending longitudinally of the device, a wedge portion, the lowest portion starting in the rearfoot portion of the device and increasing to the forefoot portion of the device and terminating in a highest point of the device at a first locus toward the forefoot portion of the device and disposed intermediate the midline of said device and said medial side and adapted to underlay and support the second metatarsal head area of said foot, and a second locus disposed toward the rearfoot portion of the device and disposed intermediate the midline of said device and said medial side, said wedge portion including first and second sloping portions meeting at a ridge, said first sloping portion extending from said ridge to said medial side and said second sloping portion extending from said ridge to said lateral side, and said ridge extending longitudinally from said first locus to said second locus, said ridge being generally in a straight path intermediate said midline and said medial side.

4,517,982
SENSING DEVICE FOR CARDIO-PULMONARY FUNCTIONS

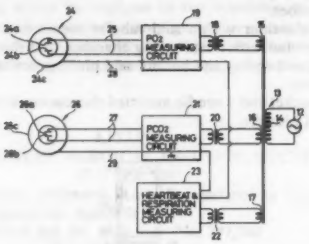
Tetsuya Shiga; Shinichi Okawa; Kenichi Yoshida, and Junichi Hiramoto, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 9, 1982, Ser. No. 406,145
Claims priority, application Japan, Aug. 10, 1981, 56-124180
Int. Cl.³ A61B 5/00, 5/04, 5/08
U.S. Cl. 128—635 7 Claims

1. A sensor device for the measurement of cardio-pulmonary functions, comprising:

first means for the transcutaneous measurement of a blood gas partial pressure, said first means including sensing elements and a heat conducting member having a skin contact surface and surrounding the sensing elements of said first means; and

second means for measuring at least one of the heartbeat and respiration rate, said second means including an electri-

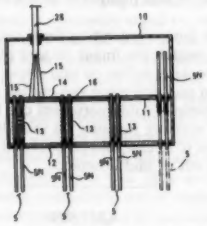


cally conducting electrode comprising said heat conducting member.

4,517,983
ELECTRODE SETS WITH RESILIENTLY MOUNTED PIN ELECTRODES

Yasuhiro Toyosu, 15-5, Minamikomatsushimacho, Komatsushima-shi, Tokushima, Japan (773), and Norio Akamatsu, 1-8, Higashiyoshinocho 2-chome, Tokushima-shi, Tokushima, Japan (770)

PCT No. PCT/JP82/00001, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/02333, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 4, 1982, Ser. No. 405,955
Claims priority, application Japan, Dec. 31, 1980, 55-187524
Int. Cl.³ A61B 5/04
U.S. Cl. 128—639 7 Claims



1. An electrode for an electrocardiograph used for measuring potentials of a number of points of a body surface near the heart and producing an isopotential map thereof, said electrode comprising:

a plurality of pin contact sets each being conductive at least on its surface and each having a plurality of movably mounted parallel pin contacts for movement reciprocally in the direction of their lengths for directly contacting the human body surface; and

resilient members, one connected to each pin contact for resiliently urging the end of each pin contact in the direction of its length toward the human body surface;

the pin contacts of each set being mounted in a small area close to one another on said electrode and being mutually electrically connected in parallel, the space between the pin contacts of each pin contact set being much smaller than the space between the adjacent small areas of the pin contact sets, whereby the potential at a position on the body surface contacted by a pin contact set can be detected as long as one pin electrode in the set is in good contact with the body, even if the other pin contacts in the set are in bad contact.

4,517,984
ESOPHAGEAL PROBE

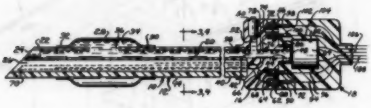
Alfred R. Perlin, Highland Park, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 321,878, Nov. 16, 1981, , which is a continuation of Ser. No. 128,001, Mar. 7, 1980, abandoned. This application Apr. 4, 1984, Ser. No. 596,488

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.[3] A61B *5/02*

U.S. Cl. 128—642 4 Claims



1. An esophageal probe comprising:

a shaft assembly comprising an elongated shaft having a distal end, a proximal end, an opening adjacent said distal end, an inflation lumen extending through the shaft, the lumen communicating with the opening, an inflatable balloon extending around a distal portion of the shaft and defining a cavity communicating with the opening and thus the inflation lumen, means closing the lumen at the distal end of the shaft, a flexible membrane attached to and closing the lumen at the proximal end of the shaft, a fluid sound transmitting medium filling said lumen and said balloon, inflation means comprising valve means on the shaft communicating with the inflation lumen to permit passage of the fluid into the inflation lumen to fill the lumen and inflate the balloon, the sound transmitting medium being sealed within the shaft by the lumen, membrane, balloon, valve means and means closing the lumen at the distal end of the probe, a connector at the proximal end of the shaft, at least one conductive electrode on a distal portion of the shaft, and first conductor means electrically connecting the electrode with the connector at the proximal end of the shaft;

a second connector releasably attached to the first connector and having a proximal end, a distal end, an electrical sound detection device encased therein; and second electrical conductor means therein terminating at the second conductor distal end; and

quick disconnect means for releasably attaching the second connector to the first connector and for simultaneously establishing electrical connection between the first and second conductor means, the quick disconnect means comprising mating means on the shaft proximal end and the second connector distal end, the flexible membrane on the proximal end of the shaft and the electrical sound detection device in the second connector being so located as to be in face to face contact when the first and second connectors are attached together by the quick disconnect means, whereby, in use, heart and/or lung sounds of a patient acoustically sensed by the sound transmitting medium are transmitted directly to the flexible membrane and thus directly to the sound detection device, for conversion into electrical signals which may be further transmitted and converted into intelligible information, and further whereby, after use, said shaft assembly may be discarded and substituted with another shaft assembly of similar construction for use on another or the same patient.

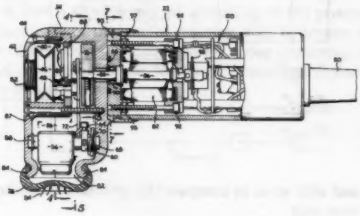
4,517,985
NEONATE ULTRASONIC SCANNER

Georg Teslawski, Menlo Park, and Paul D. Corl, Mountain View, both of Calif., assignors to Diasonics, Inc., Milpitas, Calif.

Continuation of Ser. No. 383,562, Jun. 1, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 598,492

Int. Cl.[3] A61B *10/00*

U.S. Cl. 128—660 7 Claims



1. An ultrasonic scanner comprising:

a hand-holdable housing including an upper head assembly and a lower drive assembly;

a fluid chamber within said upper head assembly, including a membrane defining a portion of said chamber for contacting a body;

a fluid disposed within said fluid chamber;

an ultrasonic transducer within said fluid chamber mounted for pivotal movement about an axis, such that ultrasound from said transducer passes through said membrane into said body;

drive means for pivoting said transducer about said axis in an asymmetric oscillatory motion, such that the time required for said transducer to sweep in one direction is different than the time required for said transducer to pivot in the opposite direction, said drive means including:

a flywheel disposed within said fluid chamber;

a motor coupled to said flywheel, for rotating said flywheel at a substantially constant motor speed;

linkage means disposed within said fluid chamber, including a link coupled off-center to said flywheel and to said transducer, for asymmetrically oscillating said transducer about said axis.

4,517,986
FOUR FUNCTION VITAL SIGN MONITOR

Ilhan M. Bilgutay, 1063 Cephas Rd., Clearwater, Fla. 33575

Filed Mar. 5, 1984, Ser. No. 586,550

Int. Cl.[3] A61B *5/02*

U.S. Cl. 128—671 16 Claims

1. An apparatus of the type designed to monitor the vital signs of a person, comprising,

a cuff to exert pressure on any preselected artery of a person,

means for inflating and deflating said cuff,

means for controlling the deflation rate of said cuff so as to maintain the rate at a substantially constant value during the deflation of said cuff,

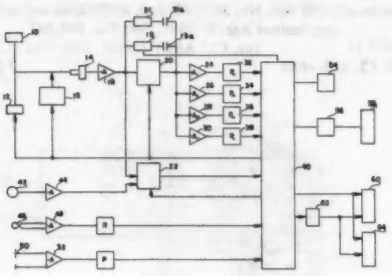
a transducer coupled to said cuff which transmits pressure signals proportional to the pressure of said cuff and pressure pulses from said artery,

an analog to digital converter responsive to pressure signals from said transducer to convert said pressure signals to digital representations,

a plurality of amplifiers coupled to said transducer and respectively responsive to pressure pulses having the smallest amplitude, the highest amplitude and amplitudes therebetween, for providing transmission indications of said pressure pulses,

a microprocessor coupled to said analog to digital converter

and said amplifiers to receive transmission indications of said pressure pulses and digital representations of the pressures at which said pressure pulse transmissions start



and end, so as to compute the systolic and diastolic pressure, and

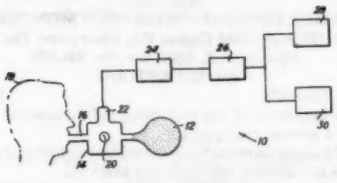
means associated with said microprocessor for displaying the systolic and diastolic pressure values.

4,517,987

METHOD FOR MEASUREMENT OF NONRADIOISOTOPIC AEROSOL RETAINED IN THE LUNGS WITH RE-BREATHING

Marvin A. Sackner, 300 W. Rivo Alto Dr., Miami Beach, Fla. 33140, and Chong S. Kim, 12040 SW. 112 Ave., Miami, Fla. 33176

Filed Apr. 2, 1982, Ser. No. 364,711
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—719 **5 Claims**



1. A method for determining a subject's airway function as affected by airway cross-sectional dimensions and/or retention of tracheobroncheal secretions, comprising:

said subject re-breathing an inert aerosol from a closed system;

determining the aerosol concentration in said closed system during each of a plurality of breaths;

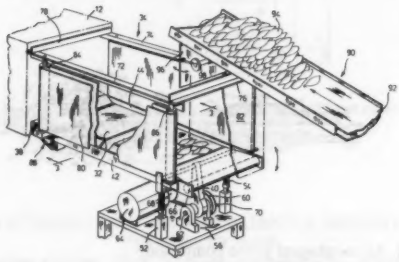
comparing said aerosol concentration determination after each of said plurality of breaths with a predetermined aerosol concentration value to identify differences therebetween, wherein identified differences indicating enhanced aerosol deposition signify airway narrowing and/or an increase in accumulated airway secretions.

4,517,988

FEEDING TOBACCO CUTTING MACHINES

Warren A. Brackman, 342 Dickson Park Crescent, Mississauga, and Stanislav M. Snaidr, 4155 Sharonton Ct., Mississauga, Ontario, both of Canada

Division of Ser. No. 381,213, May 24, 1982, Pat. No. 4,456,018, which is a continuation-in-part of Ser. No. 215,006, Dec. 10, 1980, Pat. No. 4,369,797. This application Apr. 9, 1984, Ser. No. 598,376
Int. Cl.³ A24B *3/00, 7/08, 7/12*
U.S. Cl. 131—116 **13 Claims**



1. In an apparatus for forming cut tobacco which comprises upper and lower tobacco conveyors converging towards a downstream end thereof, cutting means located adjacent said downstream end of said converging conveyors for cutting tobacco held at said downstream end and a generally horizontally-extending vibrating conveyor for conveying a layer of tobacco to the upstream end of said converging conveyors and for applying vertically-reciprocating vibrating forces thereto while conveying said tobacco layer thereon, the improvement which comprises:

confining movable side wall means located at each side of said vibrating conveyor to engage the side edges of said tobacco layer, and

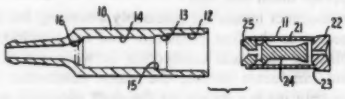
means for moving said confining side walls in the direction of movement of said tobacco layer.

4,517,989

CIGARETTE HOLDER AND FILTER CARTRIDGE

John A. Mensik, 124 Creekdale Rd., Walnut Creek, Calif. 94595

Filed May 18, 1983, Ser. No. 495,669
Int. Cl.³ A24D *3/04*; A24F *7/00, 7/02, 7/04*
U.S. Cl. 131—187 **4 Claims**



1. A cigarette holder and a filter cartridge, said holder having a first cavity at one end for axially receiving the end of a cigarette and a second cylindrical inner cavity of lesser diameter for axially receiving the filter cartridge, said filter cartridge having a housing formed with a flexible conical frustum at one end and a cylindrical sleeve, said frustum having greater circumference than said sleeve and being tapered inwardly towards the sleeve, the largest circumference of said frustum being larger than the circumference of said cylindrical inner cavity but receivable therein with a flexible binding fit due to the flexibility of said flexible conical frustum; whereby said filter cartridge may be inserted into said holder through the first cavity and said frustum lodged in said cylindrical inner cavity with a flexible binding fit.

4,517,990

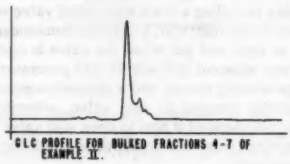
3,4,5,6,6-PENTAMETHYL HEXANOL-2 AND ALKYL HOMOLOGUES THEREOF; PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Richard M. Boden, Ocean, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 469,061, Feb. 23, 1983, abandoned, which is a division of Ser. No. 399,066, Jul. 16, 1982, Pat. No. 4,391,999, which is a continuation-in-part of Ser. No. 354,389, Mar. 2, 1982, Pat. No. 4,405,820, which is a division of Ser. No. 252,334, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Mar. 14, 1984, Ser. No. 589,504

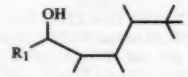
Int. Cl.[3] A24B *3/14*

U.S. Cl. 131—276 3 Claims



GLC PROFILE FOR BULKED FRACTIONS 4-7 OF EXAMPLE II.

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article comprising the step of intimately admixing with said smoking tobacco composition or smoking tobacco article an aroma or taste augmenting or enhancing quantity of at least one alcohol defined according to the structure:



wherein R_1 is C_1–C_3 alkyl.

4,517,991

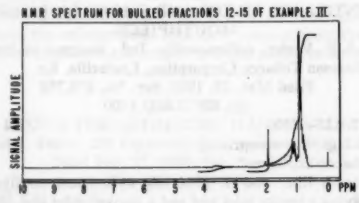
3,4,5,6,6-PENTAMETHYL HEXANOL-2 AND ALKYL HOMOLOGUES THEREOF; PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Richard M. Boden, Ocean, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 469,061, Feb. 23, 1983, abandoned, which is a division of Ser. No. 339,066, Jul. 16, 1982, Pat. No. 4,391,999, which is a continuation-in-part of Ser. No. 354,389, Mar. 2, 1982, Pat. No. 4,405,820, which is a division of Ser. No. 252,334, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Apr. 26, 1984, Ser. No. 604,213

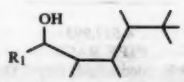
Int. Cl.[3] A24B *3/12*

U.S. Cl. 131—276 4 Claims



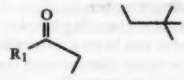
NMR SPECTRUM FOR BULKED FRACTIONS 12-15 OF EXAMPLE III.

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobacco compositions or smoking tobacco article components comprising the step of adding to said consumable material an aroma or taste augmenting or enhancing quantity of a composition of matter including a major proportion of a compound defined according to the structure:



wherein R_1 is C_1–C_3 alkyl produced according to the process consisting essentially of the step of reacting with hydrogen in the presence of a catalyst selected from the group consisting of Raney nickel and Rhodium at least one compound defined according to the structure:

wherein in the compound having the structure:



one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines are carbon-carbon single bonds at a temperature in the range of from 100° C. up to 200° C. and at a pressure in the range of from 400 psig up to 1400 psig.

4,517,992

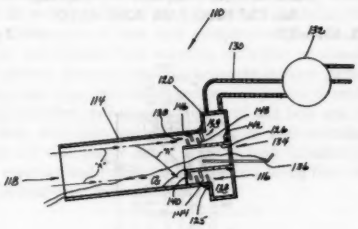
TOBACCO CONDITIONING APPARATUS

Kevin R. Korte, and Daniel D. Snyder, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 10, 1984, Ser. No. 608,842

Int. Cl.[3] A24B *3/04, 9/00*

U.S. Cl. 131—304 20 Claims



1. A tobacco conditioning apparatus for conditioning tobacco with a gas comprising:

an outer rotatably mounted, hollow cylindrical drum having a tobacco entrance at one end and a tobacco outlet at the opposite end;

an inner, hollow cylindrical drum coaxially located within the outer drum and extending through the tobacco entrance of the outer drum a predetermined distance less than the entire length of the outer drum, the inner drum interior defining the sole means for receiving tobacco into the conditioning apparatus, the inner drum being attached to the outer drum for rotation therewith;

an annular treating gas flow-through passageway defined between the outer drum and the inner drum; and,

means located within the annular treating gas flow-through passageway defining a sinuous gas flow path through the passageway.

4,517,993

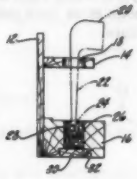
PIPE RACK

John D. Tobias, 233 E. Bloomfield, Royal Oak, Mich. 48073

Filed Sep. 13, 1982, Ser. No. 417,792

Int. Cl.[3] A24F *9/14*

U.S. Cl. 131—329 8 Claims



1. A pipe rack comprising:

a vertically extending member;

a generally horizontally extending bracket connected at one end to said member and having a plurality of holes therein for receiving pipe stems oriented such that their associated mouthpieces extend downwardly;

a generally horizontally extending base connected to lower portions of the member, said base having a plurality of chambers therein in vertical alignment with the holes in the bracket for receiving the mouthpieces of the pipes;

fibrous material made of loosely packed cotton filaments located within the chambers adapted to come into contact with the mouthpieces of the pipes; and

a plate slideably engaged in a track in lower portions of the base serving as a removable cover for the lower portions of the chambers.

4,517,994

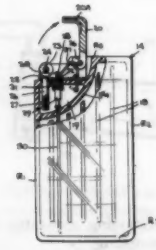
FLAT CIGARETTE LIGHTER

Robert A. Endelson, New York, N.Y., assignor to Microtech Associates, New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,724

Int. Cl.[3] F23Q *2/16*; A24F *47/00*

U.S. Cl. 131—329 2 Claims



1. In combination with a standard soft cigarette pack wherein cigarettes are housed within an inner wrapper to form a crushable body which is enveloped and sealed within an outer wrapper having a rectangular face, said inner wrapper having a corresponding face which is spaced from the outer wrapper face by the insertion therebetween of a flat, ultra-thin cigarette lighter when the top portion of the outer wrapper is removed to provide access to the cigarettes, whereby the inserted lighter then functions as a stiffener to resist crushing of the pack without substantially altering the overall dimensions thereof, said lighter comprising:

A a shallow generally rectangular container having a card format molded of synthetic plastic material to provide a reservoir which is filled with a liquefied gas that subjects the container to high internal pressure, said container having front and rear walls defined by parallel plates which are joined together by ribs to resist the pressure produced by the liquefied gas, said container having a width approaching the width of said wrapper faces, a length that is somewhat shorter than that of the wrapper faces and a thinness which allows insertion of the container in the space between said wrapper faces without distortion of the pack; and

B a lighter assembly mounted on the upper portion of the container and having substantially the same thinness, said assembly including a normally-closed valve whose inlet is coupled to the reservoir, a nozzle communicating with the valve to emit said gas when the valve is opened, a spark generator adjacent said nozzle, said generator, when actuated, producing sparks, and a manually-operated actuator operatively coupled to said valve, whereby when the actuator is operated it acts to open said valve to cause gas to be emitted from said nozzle to be ignited by sparks from the generator.

4,517,995

FILTERS FOR POLYNUCLEAR AROMATIC HYDROCARBON-CONTAINING SMOKE

Mark B. Lyles, 1700 S. Third St., Louisville, Ky. 40208

Filed Oct. 23, 1981, Ser. No. 314,424

Int. Cl.[3] A24D *3/08, 3/10, 3/12, 3/14*

U.S. Cl. 131—334 44 Claims

36. A filter cigarette comprising a tobacco tube and a filter connected to one end of said tube, said filter comprising filtering material for removing particulate matter from tobacco smoke passing therethrough, at least one purine distributed on the surface of said filtering material for removing polynuclear aromatic hydrocarbons from smoke passing through the filter, said filter being substantially devoid of other materials which would mask a substantial part of the purine from contact with the smoke or substantially reduce its removal of polynuclear aromatic hydrocarbons from the smoke.

4,517,996

VENTILATED FILTER AND SMOKE DISPERSING MOUTHPIECE

Rudolph P. Vester, Jeffersonville, Ind., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 25, 1983, Ser. No. 478,758

Int. Cl.[3] A24D *3/00*

U.S. Cl. 131—339 14 Claims

9. A cigarette comprising:

a tobacco column;

a porous filter rod of generally cylindrical configuration having a smoke inlet end and a smoke outlet end, the filter rod being coaxially located at one end of the filter rod with the inlet end of the filter rod in juxtaposition with the end of the tobacco column;

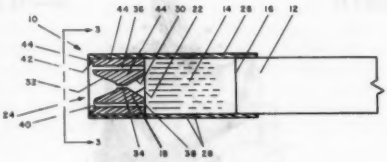
a smoke and air impermeable mouthpiece of generally cylin-

drical configuration having a smoke inlet and a mouth end, the mouthpiece being coaxially located with the filter rod and having its smoke inlet end in juxtaposition with the smoke outlet end of the filter rod;

means providing for the flow of ambient ventilating air into the filter rod;

means defining a generally conical converging nozzle in the mouthpiece in open flow communication with the smoke outlet end of the filter rod;

means defining a generally conical diverging nozzle in the



mouthpiece downstream, relative to the direction of smoke flow through the mouthpiece, of the converging nozzle means, the diverging nozzle means having its divergent end open to the mouth end of the mouthpiece;

means defining a smoke flow capillary from the converging nozzle means to the diverging nozzle means; and,

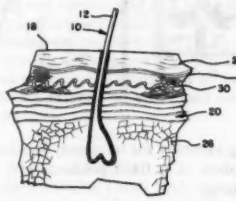
means defining a plurlity of smoke flow capillaries extending generally longitudinally through the mouthpiece, each of the smoke flow capillaries having an open inlet end open to the smoke outlet end of the filter rod and an open outlet end open to the mouth end of the mouthpiece.

4,517,997

HAIR IMPLANT STRUCTURE

A. Patrick Forchetti, 1412 Wharton St., Philadelphia, Pa. 19146

Filed Dec. 6, 1979, Ser. No. 100,899
Int. Cl.³ A41G *3/00*
U.S. Cl. 132—5 **8 Claims**



1. In a hair implant structure for implanting below the skin surface, the combination of

an elongate, thin, filament of natural or artificial hair, said filiment having a bottom end for implanting into the skin;

an enlargement secured to the filiment at the bottom end thereof; and

an inert coating applied to the bottom end and covering at least the enlargement, said inert coating being the outermost layer in the so-coated portion of the structure.

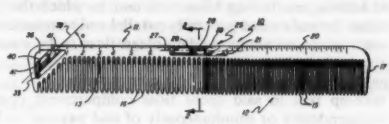
4,517,998

COMB FOR GEOMETRIC HAIR STYLING

Samuel J. Furco, 230 Plymouth Dr., Syracuse, N.Y. 13206

Filed Feb. 27, 1984, Ser. No. 584,129
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 R **6 Claims**

1. A combination comb and guide for aiding in the cutting and trimming of hair that includes a generally linear backbone having a series of teeth perpendicularly disposed from the bottom edge of the backbone said teeth being of substantially equal length so that the tips thereof lie in a common plane that is parallel with the top edge of the backbone, an elongated bubble chamber mounted for viewing in the backbone with the axis of the chamber being parallel with the top edge of said backbone whereby the bubble is centered in the chamber when



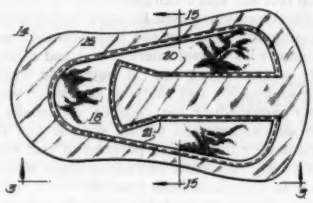
the top edge is situated in a horizontal plane, said bubble chamber being formed of a transparent material and being recessed below the top edge of the backbone within a slotted opening that is passed downwardly through said top edge of the backbone to permit the bubble to be viewed from the top and either side of the comb.

4,517,999

HAIRPIECE AND METHOD OF MAKING SAME

Paul V. Finamore, 5525 N. Pioneer Ave., Chicago, Ill. 60656

Continuation-in-part of Ser. No. 446,242, Dec. 2, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 626,310
Int. Cl.³ A41G *5/00*
U.S. Cl. 132—53 **25 Claims**



1. In a hairpiece, the combination comprising a foundation including a one-piece flexible molded plastic sheet member having a shape substantially to conform to the head of a wearer and having a single hole therethrough extending across from about 20 to 60 percent of the area of the foundation for facilitating dissipation of heat and perspiration generated by the wearer, said plastic sheet member including an annular marginal portion and an integral transverse portion partially traversing said hole, reticulate sheet means joined to said flexible plastic sheet member along a margin of said hole and covering said hole, and hairs secured directly to said reticulate sheet means and said plastic sheet member, said foundation plastic sheet member and reticulate sheet means being free of overlying material save for said hairs.

4,518,000

DENTAL FLOSS APPLICATOR

Edward H. Leverette, 10014 S. Union, Chicago, Ill. 60628

Filed Apr. 27, 1983, Ser. No. 489,126
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 A **4 Claims**

1. For use in storing and holding dental floss taut to be applied between the teeth for a flossing operation and advancing the spent floss to provide a fresh supply of clean floss for a next succeeding flossing operation,

a generally hollow container of a size conveniently fitting the hand of an average individual and having a longitudinally extending interior wall separating the container into a clean floss compartment and a spent floss compartment,

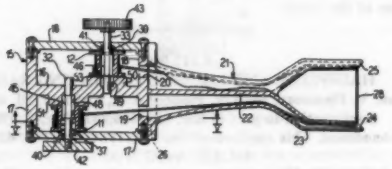
said container having one closed end wall and an opposite end wall having spaced passageways leading therethrough, a hollow arm leading from the passageways leading through the opposite end wall and having separate passageways leading from and to said last mentioned passageways,

said hollow arm having bifurcated end, in which the furcations thereof extend generally parallel and terminate in the same plane, to accommodate clean floss to be stretched thereacross,

a pay-out reel in said clean floss compartment,

a take-up reel in said spent floss compartment operable independently or simultaneously of said pay-out reel,

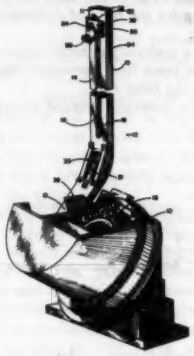
whereby clean floss may be paid from said clean floss compartment and along an associated passageway in said end wall to and along an outlet passageway in said hollow arm and along a furcation thereof and across said furcations of said hollow arm and inwardly along the opposite furcation and be wound on said take-up reel and maintained



taut across said furcations by cooperation between said take-up reel and said clean floss reel,

an individual transverse shaft for each reel extending across said casing and rotatably and translationally mounted at their inner ends in said interior wall and extending outwardly of said casing out the outer side walls thereof, keying sockets for said shafts in said inner wall, keying member intermediate the ends of said shafts, movable within said sockets and having slidable and keying engagement with the interior portions of said reels, spring means biasing said shafts into engagement with said sockets to hold said shafts from rotation,

and means selectively operable from the exterior of said container to independently translationally or rotatably move either of said shafts to effect indexing of said shafts to hold said reels from rotation or independently release either or both of said keying members from said sockets to attain independent rotatable movement of either of said shafts and supply and maintain taut clean floss across the away from said outlet slot than said first position, and biasing means for urging said ejector member in said first position



whereby said ejector member urges said coins toward said outlet slot and forcibly ejects them therethrough.

4,518,001

COIN HANDLING APPARATUS

Doud R. Branham, Sparks, Nev., assignor to International Game Technology, Reno, SR 3 03111985 32 05211985 ZZX None 10 1 1 Bartuska; F. J. 1 4 19

Filed Apr. 26, 1982, Ser. No. 371,548
Int. Cl.³ G07D *1/00*
U.S. Cl. 133—5 R **10 Claims**

1. In a coin handling apparatus including a hopper payout assembly and an elongated duct having front and back panels, first and second edge panels, and a channel therein for receiving a stack of coins of a given denomination in single edge-to-edge file, between an inlet and an outlet end, said inlet end of said channel communicating with a payout chute of said hopper, and a single outlet slot in the first edge panel at said outlet end, the improvement comprising:

a coin ejector assembly including an ejector member for forcibly ejecting coins through said outlet slot comprising a roller extending into said channel adjacent the outlet end thereof, and rotatable about an axis substantially normal to said front and back panels and movable between a first position closer to said second edge panel than said first edge panel and off-center relative to the width of said channel in a direction away from said outlet slot and a second position further

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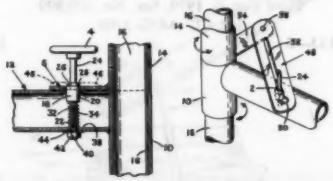
4,518,002

FOLDABLE WALKER WITH PLUNGER ACTUATED LATCH ASSEMBLY

Joseph D. Battiston, Sr., and Joseph Battiston, Jr., both of Clifton, N.J., assignors to Tubular Fabricators Ind., Inc., Passaic, N.J.

Filed Nov. 8, 1982, Ser. No. 440,051
Int. Cl.³ A61H *3/00*; F16C *11/00*
U.S. Cl. 135—67 **14 Claims**



1. A locking assembly for releasably locking two articulated pivoting members in a fixed position with respect to each other, comprising:

A. a spring biased reciprocating latch;

B. a plunger attached to said latch;

C. a catch plate adapted to releasably engage said latch;

D. said spring biased latch reciprocably mounted within a first pivoting member and comprising

a longitudinally extended locking bolt adapted for retractable protrusion from said first pivoting member, a reduced diameter guide rod extending from said locking bolt external to said first pivoting member, and a cam surface located between said locking bolt and said guide rod, and adapted to slidably engage said catch plate;

E. said catch plate mounted external to the second pivoting member and comprising a moveable strip defining a collar at one end thereof adapted to releasably retain said locking bolt, and a closed track communicating with said collar defining an access way for said latch to enter and escape from said collar, and said catch plate pivotally attached to said second pivoting member and also adapted to slide and pivot about said guide rod; and

F. said plunger mounted on said guide rod on the free end thereof, to receive and transmit pressure against said lock-

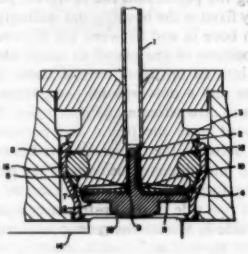
ing bolt to urge said locking bolt into the retracted position, for release from said collar.

4,518,003

PRESSURE RESPONSIVE CAP FOR GAS APPLIANCES

Jean-Claude Charron, 14, Ave. du Lac, 94100 Saint-Maur, France

Filed Jan. 24, 1983, Ser. No. 460,388
Claims priority, application France, Jan. 25, 1982, 82 01060
Int. Cl.³ F23D 5/16
U.S. Cl. 137—65 14 Claims



1. A pressure responsive assembly for controlling the supply of gas to a gas appliance having an air bulb adapted to be positioned in the pilot flame of said appliance, a capillary tube (1) connected at one end to said air bulb and at its other end to a channel (2) of a plug and an expansible membrane supported to the plug (3) for controlling the supply of gas to said gas appliance in response to the movement of said membrane between a first and a second position, the improvement comprising an aperture (5) being defined by a rim porting (10) in said membrane (4) and in alignment with the channel (2) of the plug (3), actuating means (6–17) having at least a portion thereof adapted to be received within said channel, said actuating means having a supporting surface being cooperatively associated with said rim portion (10) and being so constructed and arranged so as to enable external air to flow to the interior of said air bulb through the capillary tube (1) by means of said aperture (5) and through said channel (2) when said membrane (4) is in the second position and to seal the air bulb and capillary tube (1) from said external air when said membrane (4) is in the first position.

4,518,004

MULTIFUNCTION VALVE

William W. Hsu, Burbank, and Manfred A. Runkel, Valencia, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Nov. 21, 1983, Ser. No. 553,601
Int. Cl.³ F15B 13/04
U.S. Cl. 137—116 5 Claims

1. In a hydraulic control circuit for providing flow of fluid under pressure between a source and return thereof to a load responsive to positioning of a control valve the improvement of a combination valve means in a unitary housing interposed between said control valve and said source/return for providing a plurality of functions normally provided by a plurality of separate valves, said valve means comprising:

(A) a housing defining a first bore therein;

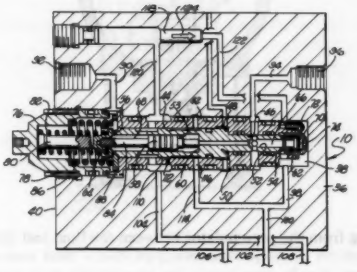
(B) a first spool valve having lands and grooves slidably disposed within said first bore and defining a second bore therein;

(C) a second spool valve reciprocally disposed within said second bore and closing said second bore at a first position;

(D) a first poppet means disposed adjacent one end of said second bore and urged thereagainst to close said second bore at a second position displaced from said first position thereby defining a first closed chamber within said first spool valve between said first poppet and said second spool valve;

(E) first passageway means for connecting said fluid pressure source to said first closed chamber;

(F) a second poppet means disposed adjacent the opposite end of said second bore and urged thereagainst to close said opposite end of said second bore thereby defining a second closed chamber within said first spool valve between said second spool valve and said second poppet, said second spool valve engaging said second poppet means;



(G) second passageway means for connecting said return to said second poppet means;

(H) third and fourth passageway means for connecting said first poppet and said second chamber to said control valve;

(I) said first and second poppets normally blocking communication of said third and fourth passageways with said first and second passageways respectively in the absence of said fluid under pressure and permitting communication therebetween upon the application of fluid under pressure to said first chamber.

4,518,005

GUIDED FLOAT ACCUMULATOR

Murry Allewitz, Houston, Tex., assignor to Koomey, Inc., Brookshire, Tex.

Continuation-in-part of Ser. No. 373,185, Apr. 29, 1982, abandoned. This application Mar. 3, 1983, Ser. No. 471,929
Int. Cl.³ F16L 55/04
U.S. Cl. 137—207 2 Claims

1. A gas-liquid accumulator comprising,

a spherical cast metal housing having top and bottom ports,

said top port adapted to receive a gas charging and release valve,

a circular valve seat in an assembly releasably secured in the bottom port, said seat tapering downwardly and inwardly,

a resilient coating positioned on the valve seat and having a circular ring projecting upwardly,

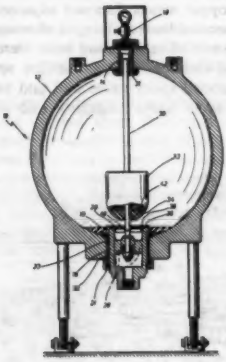
a vertical guide rod connected to the valve seat assembly and extending upwardly in the housing,

a generally cylindrical solid syntactic foam float slidably mounted on the rod, said float having a rounded valve element on the bottom for seating on the valve seat, the diameter of the float being less than the diameter of the bottom port whereby the float may be removed through the bottom port, said valve element including a resilient coating,

said float including a bevel surface on the bottom around the guide rod, and

a seal on the guide rod positioned below the float and posi-

tioned to engage the bevel surface when the valve element is seated on the valve seat for preventing gas from escaping from the accumulator between the float and the guide rod.



4,518,006

BACKFLOW-PREVENTING VALVE

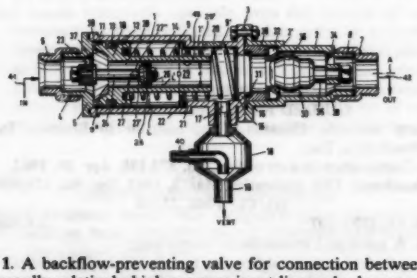
Peter Hoffmann, Bernhaupten, and Walter Evers, Ennepetal, both of Fed. Rep. of Germany, assignors to Lang Apparatebau GmbH, Siegsdorf, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 474,744

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 8207222[U]

Int. Cl.³ F16K *15/20*

U.S. Cl. 137—218 **7 Claims**



1. A backflow-preventing valve for connection between a normally relatively high-pressure input line and a lower-pressure output line, the valve comprising:

a valve housing forming an upstream chamber and a downstream chamber and having an inlet opening into the upstream chamber remote from the downstream chamber, a vent opening into the upstream chamber offset from the inlet, and an outlet opening into the downstream chamber, the inlet normally being connected to the high-pressure input line, the outlet normally being connected to the lower-pressure output line, and the vent being open to the outside;

means including a check valve in the downstream chamber for allowing flow from the upstream chamber into the downstream chamber and for blocking flow from the downstream chamber into the upstream chamber;

a tubular piston sealingly engaged across the upstream chamber upstream of the vent, formed with a throughgoing bore, and having a downstream end sealingly engageable in the downstream chamber, the piston being movable between an upstream position with its downstream end in the upstream chamber spaced from the downstream chamber and a downstream position with its downstream end engaged sealingly in the downstream chamber and through an intermediate position with its downstream end spaced upstream of the downstream chamber, fluid flow through the bore from the inlet to the vent only being possible in and between the upstream and intermediate positions, fluid flow between the inlet and the vent and between the outlet and the vent being blocked by the piston in its downstream position;

a spring braced between the piston and the valve housing and urging the piston into the upstream position; and

a valve body fixed in the housing and sealingly engageable in the piston bore in and between the intermediate and upstream positions of the piston to subdivide the upstream chamber into an upstream compartment into which the inlet opens and a downstream compartment into which the vent and downstream chamber open, the valve body being spaced from the piston and permitting free fluid exchange between the compartments between the downstream and intermediate positions of the piston, the valve body being formed with a small-diameter bleed passage opening at one side in the upstream compartment and at the other side in the downstream compartment.

4,518,007

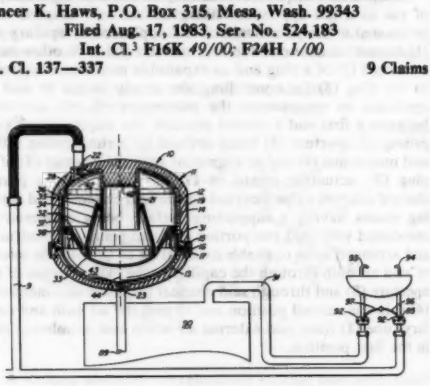
AUTOMATIC HOT WATER RECOVERY SYSTEM

Spencer K. Haws, P.O. Box 315, Mesa, Wash. 99343

Filed Aug. 17, 1983, Ser. No. 524,183

Int. Cl.³ F16K *49/00*; F24H *1/00*

U.S. Cl. 137—337 **9 Claims**



1. A differential pressure reservoir for recovering heat from a hot water system having a backflow of cold water for forcing hot water into a water heater, comprising:

a casing enclosing a cylindrical interior end having first and second water ports for inlet and outlet of water;

a piston slidingly disposed in the cylindrical interior between said first and second water ports and having first and second faces, said first face having an effective area for exposure to water pressure which is smaller than the effective area of said second face, said piston dividing said cylindrical interior into first and second chambers, whereby movement of the piston along a central axis of the cylindrical interior changes the volume of the second chamber formed by said second face of the piston with the larger effective area more than the volume of the first chamber formed by said first face with the smaller effective area; and

valve means for allowing water to flow from the first chamber to the second chamber when the piston is in a position to minimize the volume of the second chamber on the side of the piston with the larger effective area;

said reservoir for mounting in the cold water inlet conduit of said water heater.

4,518,008

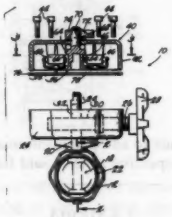
QUARTER TURN VALVE INCLUDING SUPERVISORY SWITCH ASSEMBLY

Abraham S. Fenster, Fox Point, and Lawrence W. Buechler, Franklin, both of Wis., assignors to Milwaukee Valve Company, Milwaukee, Wis.

Filed Jun. 24, 1983, Ser. No. 507,791

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—552 12 Claims



1. A quarter-turn valve including

a body having a flow passage extending therethrough;

a valve member disposed in said flow passage and carried on a stem rotatably mounted in said body, said stem having an outer end portion extending outwardly from said body;

operating means connected to said stem for rotating said stem through a quarter turn to open and close said valve member; and

a supervisory switch assembly adapted to be connected to an electrical system for producing a warning signal in response to an unauthorized movement of said valve member or to someone tampering with said switch assembly, said switch assembly including

a housing mounted on said body and enclosing said outer end portion of said stem,

an electrical switch mounted in said housing, said switch being adapted for connection to the electrical system, being movable between one position to close an electrical circuit and another position to interrupt an electrical circuit, and having an actuation means for moving said switch from one position to the other in response to being engaged,

cam means mounted on said outer end portion of said stem for common rotation therewith and arranged to selectively engage said switch actuation means, in response to rotational movement of said stem, to cause movement of said switch from one position to the other; and

tamper means for causing movement of said switch from one position to the other in response to someone tampering with said housing.

4,518,009

DEVICE FOR FUEL TANKS FOR CARS

Wolfram Schiemann, Eugen-Nagele-Strasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,322

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225351

Int. Cl.³ B67D *5/00*

U.S. Cl. 137—571 10 Claims

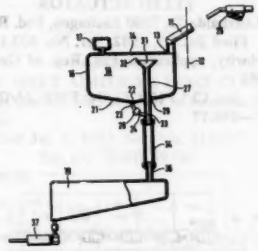
1. Device for a fuel tank for a car having a main fuel tank, comprising an inlet to said main tank, a filling tube for filling said main tank located above said inlet to said main tank, ventilation box, and a piping system leading from said filling tube to said main tank, wherein the improvement comprises:

(a) a reserve tank being located within said piping system and above said inlet to said main tank, said reserve tank having an upper wall and a wall with an opening therein, said reserve tank communicating with said filling tube for filling said main tank,

(b) a pipe protruding into said reserve tank, having at one end an upwardly open upper rim, whereby the height of said upper rim determines the volume of gasoline reserve inside said reserve tank, said pipe travelling via said opening through said wall of said reserve tank, said pipe forming at its other end said inlet to said main tank,

(c) said ventilation box being located at a point above said upper wall of said reserve tank, and

(d) means operable for releasing fuel in said reserve tank into said main tank comprising



a by-pass hose which by-passes said opening, having an upper end which leads into a wall area of said reserve tank, and a lower end which leads to a point downstream of said opening, and

a valve provided on said by-pass hose which when open allows fuel in said reserve tank to flow to said main tank, said valve having opening and closing means, which automatically re-adjust to a closed position.

4,518,010

PRESSURE CONTAINER FOR TWO HYDRAULIC CIRCUITS

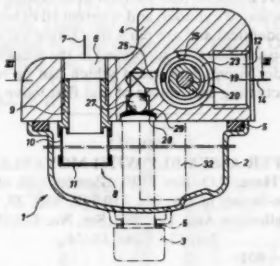
Norbert Mucheyer, Rechtenbach, and Heinz Schulte, Marktheidenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,625

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201790

Int. Cl.³ F16K *24/00*; F16D *31/02*

U.S. Cl. 137—587 8 Claims



1. An after-suction pressure fluid container for two hydraulic circuits, particularly for a steering circuit and a control circuit, comprising a lower hollow housing portion and an upper cover closing said housing portion; a suction tube inserted into said housing portion and connectable to one of said hydraulic circuits; first connection means in said cover and connectable to the other of said circuits; second connection means in said cover and connectable to a pressure fluid supply container; a pressure-limiting valve connected to said second connection means and operated so that the pressure fluid con-

tainer during operation is under predetermined pressure; filter means mounted in said cover and immediately before said first connection means; said pressure-limiting valve being connected to said second connection means; and a check valve which opens into an interior of said housing portion, said pressure-limiting valve and said check valve being mounted in said cover.

4,518,011

CONTROL VALVE UNIT FOR THE CYLINDER OF A FLUID ACTUATOR

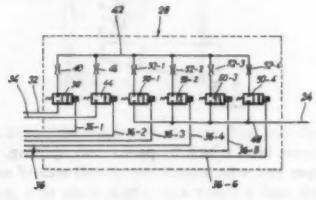
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 403,167

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130056

Int. Cl.³ F15B *11/04*; F16K *31/02*

U.S. Cl. 137—596.17 **17 Claims**



1. A valve arrangement for selectively providing fluid communication between a working chamber of a fluid actuated cylinder and a selected one of a pressurized fluid source and a fluid sink, comprising: a first valve mechanism which includes a plurality of two-way, two-position electromagnetic first valves which are connected in parallel with each other and which each include and control fluid flow through a respective throttled flow path; a second valve mechanism which includes second and third two-way, two-position electromagnetic valves which each have a first port which is in fluid communication through a distributor line with a first port of each said valve of said first valve mechanism and which each have a second port adapted to be connected to a respective one of the fluid source and fluid sink; and control circuit means for selectively actuating said valves, said control circuit means actuating only one of said valves of said second valve mechanism at any given time; wherein said valves of said first valve mechanism each have a second port adapted to be connected to a port of the fluid actuated cylinder; and wherein all of said valves are structurally identical and are parts of a single valve cartridge; whereby a piston movably supported in the working chamber of the cylinder moves at a speed which can be regulated by selectively actuating said valves of said first valve mechanism.

4,518,012

AIR DAMPER ASSEMBLY WITH MOVABLE BLADES

Robert J. O'Hara, P.O. Box 2129, Glenview, Ill. 60025

Continuation-in-part of Ser. No. 410,560, Aug. 23, 1982,. This application Aug. 12, 1983, Ser. No. 522,784

Int. Cl.³ F24F *13/16*

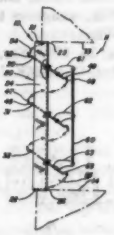
U.S. Cl. 137—601 **29 Claims**

1. An air damper assembly comprising the combination of

a frame adapted to be mounted on the walls of an air flow passageway and having flanges extending inwardly from at least one pair of opposed sides thereof, said flanges forming pairs of opposed slots,

a plurality of elongated damper blades each of which has its opposite ends extending into a pair of said opposed slots so that the blade is pivotally supported on said flanges for pivoting movement between open and closed positions, and

a pair of retaining stop means associated with each end of each blade, said retaining stop means projecting outwardly from opposite sides of the blade and on opposite sides of each of said flanges for limiting pivoting movement of the blade to an open position and for retaining the blade in the respective slots in said flanges.



4,518,013

PRESSURE COMPENSATING WATER FLOW CONTROL DEVICES

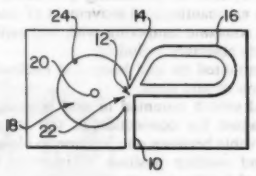
John H. Lazarus, 7 Ohlsson Way, Newlands, Cape Town, Cape Province, South Africa

Filed Nov. 29, 1982, Ser. No. 444,977

Claims priority, application South Africa, Nov. 27, 1982, 81/8267

Int. Cl.³ F15C *1/16*

U.S. Cl. 137—811 **11 Claims**



1. A pressure compensating, water flow control device comprising an inlet leading into an inlet zone, a first flow path in the form of closed loop both ends of which communicate with said inlet zone, and a second flow path leading from said inlet zone and comprising a vortex chamber, there being an outlet from the vortex chamber, the first and second flow paths being discrete so that water entering the first flow path can only reach the second flow path by flowing entirely around said closed loop and re-entering the inlet zone, first walls bounding the inlet, second walls bounding an inlet end of the closed loop and third walls bounding an outlet end of the closed loop, the first and third walls being transverse to one another so that water emerging from the loop intersects water flowing across the inlet zone from said inlet to the inlet end of the closed loop, there being a flow splitter for directing a portion of the incoming water into the first flow path and a further portion into the second flow path.

4,518,014

RELIEF VALVES FOR SANITATION SYSTEMS OR THE LIKE

James E. McAlpine, Glasgow, Scotland, assignor to McAlpine & Co., Ltd., Glasgow, Scotland

Filed Feb. 19, 1982, Ser. No. 350,545

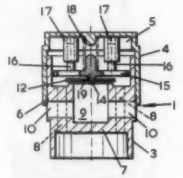
Claims priority, application United Kingdom, Feb. 21, 1981, 8105546; Apr. 22, 1981, 8112503

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—843 **9 Claims**

1. A relief valve comprising a valve body defining a valve

chamber therein, an air inlet interconnecting the valve chamber and the exterior of the valve body and defining a single continuous valve seat within the valve chamber, a freely flexible substantially air-impermeable valve element normally disposed with a sealing face thereof in resilient, conforming engagement with the valve seat to prevent inflow of air into the valve chamber through the air inlet, a rigid support member, means mounting said flexible valve element to said support



member with the face of the valve element opposite to said sealing face positioned in confronting, spaced relation to one face of said support member; and guide means including means on said support member and coacting means on said valve body for assisting the valve element into sealing engagement with the valve seat, and at least one aperture adapted to interconnect the valve chamber with a system into which the valve is fitted.

4,518,015

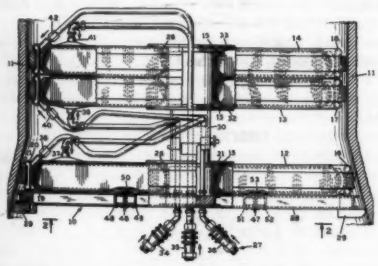
INFLATABLE PLUG

William H. Fischer, Wingdale, N.Y., assignor to The Presray Corporation, Pawling, N.Y.

Continuation of Ser. No. 351,905, Feb. 24, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,145

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—93 **10 Claims**



1. An inflatable plug for interrupting fluid flow in a pipe, comprising

(a) a substantially hollow, inflatable plug body;

(b) said plug body being formed from first and second opposed walls defining a cavity-forming chamber between them;

(c) said walls being formed from a flexible, impermeable material,

(d) said plug body having a closed surface;

(e) a plurality of thread-like, flexible, generally inelastic connector elements, each secured at one end to said first wall and at the other end to said second wall and extending generally perpendicular to said walls through the cavity of the chamber formed between said walls;

(f) said ends of said connector elements being secured to said walls in a finely distributed pattern over substantially the entire surfaces of the walls;

(g) whereby said connector elements prevent the walls of the plug body, when inflated, from separating from each other a distance greater than the length of said connector elements;

(h) an inflatable annular ring seal of flexible, impermeable material being affixed to and extending circumferencially around said hollow, inflatable plug body;

(i) said ring seal, when inflated, being arranged and configured to be in a leak tight sealing contact with the interior wall of the pipe, and

(j) an inflation system connected to each of said hollow, inflatable plug body and said inflatable ring seal;

(k) said inflation system being operable to selectively, individually inflate and deflate each of said plug body and said ring seal.

4,518,016

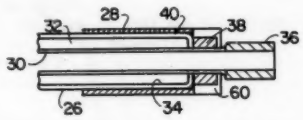
HOT MELT ADHESIVE HOSE CUFF

Robert G. Baker, Buford, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 8, 1983, Ser. No. 512,157

Int. Cl.³ B65D *59/00*

U.S. Cl. 138—96 R **3 Claims**



1. A hose cuff for a hot melt hose of the type having a rigid connector on at least one end thereof, said hose cuff comprising a cylindrical body open at both ends to receive one end of a hot melt hose, said body having an annular, external channel contained therein adjacent one of said ends and including a pair of oppositely disposed protrusions within said channel thereby dividing said channel into two semicircular sections, and a collar divided into two halves and having a rim thereon receivable within said channel of said body such that relative axial and rotational movement between said collar and said body is prevented, said collar further including means for engaging the rigid connector so as to prevent relative rotational movement between the hose and said collar and means for fastening said halves together so that said collar is fixed to said cylindrical body.

4,518,017

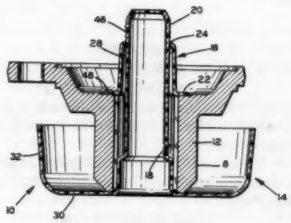
PROTECTIVE COVER ASSEMBLY

Erin D. Hennon, Lima, and Robert G. Joyner, Toledo, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 16, 1983, Ser. No. 562,265

Int. Cl.³ F16L *57/00;* **B65D** *85/06*

U.S. Cl. 138—96 R **10 Claims**



1. A protective cover assembly comprising a cover having an axially extending annulus disposed for overlying an external surface of a tubular member, a radially extending annulus supporting said axially extending annulus, an elongate projection comprising an integral portion of said radially extending

annulus and disposed for extending into the bore of said tubular member, said axially extending annulus overlying said elongate projection and adapted to cover a portion of said tubular member, said assembly further comprising a retainer for maintaining said cover in position with respect to said tubular member, said retainer comprising a support flange for engaging one end of said tubular member, and means for gripping said elongate projection comprising flexible segments on said retainer, said segments extending radially inwardly for engagement of said projection by said retainer.

4,518,018

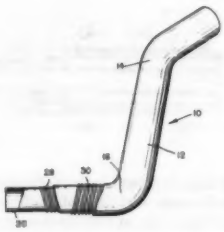
REINFORCED FORMED HOSE

Thomas A. Kutnyak, Greenwood; George T. Dunn, and Chester L. Guiles, both of Abbeville, all of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Continuation of Ser. No. 770,696, Feb. 22, 1977, abandoned. This application Jun. 2, 1980, Ser. No. 155,358

Int. Cl.³ F16L *11/12*

U.S. Cl. 138—130 **6 Claims**



1. A permanently shaped, deformable reinforced hose formed with at least one curved portion, comprising:

a first, innermost layer formed along an axis by a strip of elastomer helically wound edge to edge in a non-overlapping manner to form an essentially smooth and unbroken surface;

a second, reinforcement layer formed by a plurality of spaced, parallel reinforcing strands helically wrapped around said first, innermost layer oppositely with respect to the direction of wrap of said first, innermost layer at an angle from about 20 degrees to about 30 degrees with respect to the perpendicular to the axis of said first, innermost layer; and

a third layer formed by a strip of elastomer helically wound over and around said second, reinforcement layer,

each of said layers being bonded together by heat curing into a single, monolithic structure which can be slidably removed from a mandrel without causing any substantial separation of said reinforcing strands from the adjacent layers.

4,518,019

LUBRICATOR FOR A WEFT PICKING ELEMENT IN A WEAVING MACHINE

Otto Hintsch, Wallisellen, and Gerd Schmitz, Sulz-Attikon, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 16, 1983, Ser. No. 523,418

Claims priority, application European Pat. Off., Aug. 26, 1982, 82810354.9

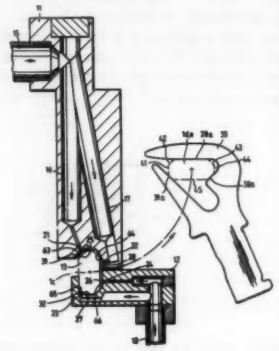
Int. Cl.³ D03J *1/00*

U.S. Cl. 139—1 R **17 Claims**

1. A lubricator for a weaving machine comprising

means defining a guide passage outside a shed of warp yarns having a plurality of guide surfaces for receiving a weft picking element with a plurality of complementary surfaces thereon;

a plurality of lubricant supply nozzles communicating with selected ones of said guide surfaces for delivering lubricant thereto to lubricate complementary surfaces on a



received picking element to be guided in said shed; and at least one lubricant supply duct for supplying a lubricant oil mist to said nozzles.

4,518,020

DRIVE ASSEMBLY FOR PRODUCING A NONUNIFORM OUTPUT FROM A UNIFORM INPUT

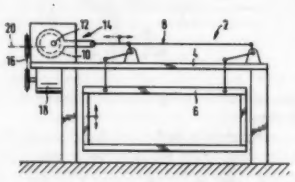
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

Filed Oct. 24, 1983, Ser. No. 544,613

Claims priority, application Switzerland, Oct. 26, 1982, 6251/82

Int. Cl.³ D03C *13/00*; F16H *35/02*

U.S. Cl. 139—55.1 **7 Claims**

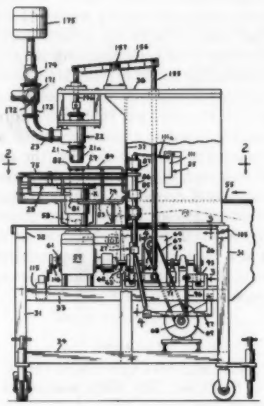


1. A drive assembly for producing a nonuniform power output from a uniform input drive, particularly for use for a shedding mechanism of a weaving machine, comprising: a drive member having a relatively uniform power input; an output shaft driven by said drive member; a pair of crankshafts offset relative to each other by 180° connected to be driven by said drive member; a pair of journals supported at two bearing positions on said output shaft and having said crankshafts supported therein; a planet wheel mounted on each of said crankshafts; a stationary sun gear arranged with said planet wheels in meshing engagement therewith; and a twin-armed rocker member connected to be driven by said crankshaft for driving said output shaft.

4,518,021
MACHINE FOR FILLING CONTAINERS

Gordon A. Copas, Rockford; Howard C. Wilke, Belvidere, and Dennis A. Dykema, Rockford, all of Ill., assignors to APV Anderson Bros. Inc., Rockford, Ill.

Filed Feb. 3, 1984, Ser. No. 576,813
Int. Cl.[3] B65B *43/58*
U.S. Cl. 141—172 7 Claims



1. A machine for filling containers with a viscous product to a preselected fill level below the top of the container comprising, a downwardly extending nozzle at a filling station having a lower discharge end dimensioned to telescopically receive an upper portion of the container and a downwardly opening discharge outlet in the lower discharge end, a product supply conduit, valve means for controlling flow of product from the supply conduit to the discharge outlet, container elevator means at the filling station including a container support platform and a yoke member spaced above the platform a distance sufficiently greater than the height of the container to allow a container to be moved horizontally into and out of a fill position on the platform and below the yoke member, elevator drive means for moving the elevator means vertically from a lower elevator position in which the container support platform is spaced below the discharge end of the nozzle a distance substantially greater than the height of the container to a raised elevator position in which the container support platform is spaced below the lower discharge end of the nozzle a distance substantially less than the height of the container to raise a container on the platform into at least partial telescoping relation with the nozzle, the yoke member having a downwardly facing container engaging surface arranged to engage the upper edge of a container when the yoke member is moved downwardly, the yoke member in the lower elevator position having said container engaging surface positioned below the lower discharge end of the nozzle and the yoke member being constructed and arranged to move alongside the nozzle when moved to the raised elevator position, means operated in timed relation with movement of the container support platform to its raised elevator position for operating the valve means to an open position to deliver product to the discharge outlet, means yieldably opposing downward movement of the container support platform from its raised elevator position toward its lower elevator position to allow the container on the platform to move downwardly under the weight and pressure of the product entering the container from the discharge nozzle, means for sensing when the container support platform moves downwardly from the raised elevator position to an intermediate elevator position in which the discharge end of the nozzle is adjacent said preselected fill level in the container, means actuated by said sensing means when the container support platform moves down to said intermediate elevator position for operating said valve means to a closed position shutting-off delivery of product to the discharge outlet and for operating said elevator drive means to positively move said elevator means from said intermediate elevator position to said lower elevator position, said yoke member being constructed and arranged to engage the upper end of the container on the nozzle when the elevator is moved downwardly from said intermediate position to move the container downwardly off the nozzle, container transfer means operated in timed relation with movement of the elevator means to its lower position to advance a filled container along a generally horizontal filled container discharge path off the container support platform and to advance an empty container along a generally horizontal container infeed path onto the container support platform.

4,518,022
OSCILLATING CUTTING ELEMENT

Guillermo A. Valdes, 4350 NW. 8 Ter., Apt. 3, Miami, Fla. 33126; Benjamin G. Pacheco, 1090 W. 69 Pl., Hialeah, Fla. 33014; Fernando F. Figueredo, 524 Ridgewood Rd., Key Biscayne, Fla. 33149, and Armando Framil, 45 SW. 28 Rd., Miami, Fla. 33129

Filed Sep. 29, 1982, Ser. No. 427,837
Int. Cl.[3] B27B *21/00*
U.S. Cl. 30—166 R 1 Claim

1. A flexible cutting element fabricated from a plurality of chain links with tubular cutting units rigidly attached to each chain link, said cutting units each having a plurality of cutting teeth protruding upwardly from the body of the cutting units and disposed at intervals in a complete circle around the periphery of each cutting unit, wherein said cutting units are fabricated in two distinct forms with,

(a) a first type of cutting unit fabricated with saw type cutting teeth configuration such that:
  (i) each cutting tooth contains a front cutting end protruding upwardly from the periphery of said cutting unit,
  (ii) the body of said cutting tooth then slopes downward to a back end which terminates at the same level as that of the base of the cutting unit,
  (iii) said front end of said cutting tooth being of a predetermined width and having a sharp cutting edge,
  (iv) said front cutting end fabricated with its sharp cutting edge slanted backwards at a predetermined angle to allow for the dislodging of cut wood particles,
(b) a second knifing type cutting unit fabricated with:
  (i) a plurality of sharp, knife configured edges protruding upwardly from the body of said cutting unit and spaced at predetermined intervals in a complete circle around the periphery of said cutting unit,
  (ii) said knife configured edges protruding upwardly and extending in a straight line at the same predetermined height from a first front end to the back second end of said cutting unit,
(c) the sawing type and knifing type cutting units attached to the chain links of the cutting element in a way such that,
  (i) each type of cutting unit is alternately attached to alternating chain links of the chain with the sawing type units attached first then a knifing type cutting unit attached second, followed again by another sawing type and knifing type cutting units thereby continuing to alternate each type of cutting unit as they are attached to the cutting element,
  (ii) the sawing type cutting units further aligned in such a way that the direction of cutting of one saw type cutting unit is opposite from the direction of cutting of the next saw type cutting unit, and these are continued to alternate as they are attached to the cutting element chain

links so that when an oscillating force is imparted on the cutting element, half of the saw type cutting units will cut in one direction and the other half will cut in the opposite direction.

4,518,023

PNEUMATIC TIRE

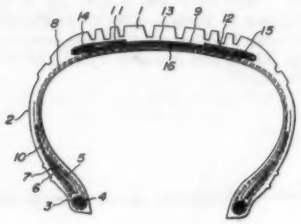
Yutaka Yamaguchi, Tokorozawa; Nobuyuki Koizumi, Higashimurayama; Masami Hirano, Kodaira; Tamio Araki, Fuchu, and Koichi Kojima, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

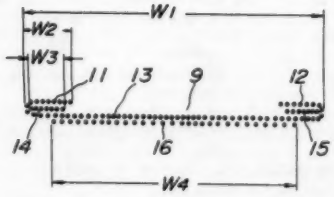
Filed Apr. 7, 1983, Ser. No. 483,034

Claims priority, application Japan, Jun. 4, 1982, 57-83218[U]

Int. Cl.³ B60C *9/20, 9/22*

U.S. Cl. 152—361 FP 4 Claims





1. A pneumatic tire comprising; a tread, a pair of sidewalls and a pair of bead portions, a carcass consisting of at least one layer of rubber coated cord ply whose organic fiber cords are arranged in parallel with each other in substantially radial surfaces of the tire, a belt comprising a rubber coated metal cord main layer folded at least at one edge, whose metal cords are arranged in parallel with each other at relatively small angles with respect to an equatorial line of the tire for reinforcing a body of the tire, said belt further comprising at least one reinforcing layer of at least one rubber coated layer arranged inside of and in substantially intimate contact with the folded edge of said rubber coated metal cord main layer of said belt and having a width of W_3 of 10–35% of an overall width of said belt, cords of said reinforcing layer being made of a thermocontracting organic fiber and being in parallel with each other at angles of 0° or near 0° with respect to the equatorial line of the tire, and an auxiliary layer arranged radially innermost in the belt and having a width less than the overall width of said belt between the folded edges of the belt, said auxiliary layer having metal cords arranged in parallel with each other and at substantially the same angles with respect to the equatorial line but in directions different from those of the rubber coated metal cord main layer, and elongations of said cords in said main, reinforcing and auxiliary layers subjected to 5 kg tensile load are progressively larger in the order of the auxiliary, main and reinforcing layers.

4,518,024

PNEUMATIC RADIAL TIRE HAVING AN IMPROVED DURABILITY IN THE RUNNING ON BAD ROAD

Tamotsu Matsunuma, Higashimurayama, Japan, assignor to Bridgestone Tire Company Limited, Japan

Filed Feb. 7, 1984, Ser. No. 577,921

Claims priority, application Japan, Apr. 27, 1983, 58-73058

Int. Cl.³ B60C *9/20*

U.S. Cl. 152—361 DM 3 Claims

1. A pneumatic radial tire having improved durability in the running on bad road, comprising; a carcass composed of at least one rubberized cord ply containing cords arranged substantially perpendicular to the equatorial plane of the tire, and a belt superimposed around the crown portion of the carcass and composed of at least two rubberized cord layers each containing cords inclined at a relatively small angle with respect to the equatorial plane of the tire, the cords of which being crossed with each other, wherein the outermost layer of said belt contains steel cords of a layer construction or single strand construction having good rubber penetration and a flexural rigidity lower than the cords of the remaining layer(s) and arranged at a higher end count than the cords of the remaining layer(s), said higher end count corresponding to a distance between cords of 0.2–0.8 mm.

4,518,025

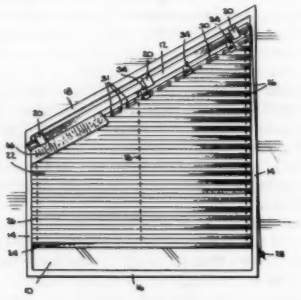
SUN BLIND CONSTRUCTION

Ren S. Judkins, Salt Lake City, Utah, assignor to Verosol USA Inc., Pittsburgh, Pa.

Filed Nov. 10, 1983, Ser. No. 550,598

Int. Cl.³ E06B *3/94*

U.S. Cl. 160—84 R 18 Claims



1. A sun blind operable between an open and a closed position for an opening having upper and lower edges, at least one of said edges being disposed, at least in part, at other than the horizontal, comprising:

first rail means disposed adjacent said upper edge of said opening conforming to the outline of said upper edge;

second moving rail means disposed adjacent the lower edge of the opening when the sun blind is in the closed position conforming to the outline of the lower edge;

a sun blinding member disposed between said first and second rail means, said sun blinding member conforming to the outline of said edge disposed at other than the horizontal and having a plurality of spaced openings disposed substantially adjacent said edge;

means conforming to the outline of the edge disposed at other than the horizontal, said means disposed through said plurality of spaced openings for retaining said sun blinding member;

means for attaching said retaining means to said rail means disposed adjacent the edge disposed at other than the horizontal; and

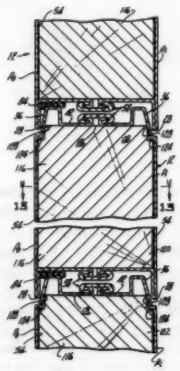
means for moving said second rail means to raise and lower said sun blinding member.

4,518,026

ENERGY EFFICIENT GARAGE DOOR CONSTRUCTION AND THE LIKE

Ronald F. Otto, and John J. Kempel, both of West Branch, Mich., assignors to Garland Manufacturing Co., West Branch, Mich.

Continuation-in-part of Ser. No. 168,537, Jul. 14, 1980, Pat. No. 4,379,480. This application Mar. 28, 1983, Ser. No. 479,741
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ E06B *3/12, 9/00*
U.S. Cl. 160—232 **1 Claim**



1. An energy efficient laminated building structure for a sectional-type door having a plurality of said structure and hinges movably connecting adjacent structures and permitting rocking movement therebetween, comprising:

first and second spaced, elongated metal panel members of identical cross-sectional shape, each panel member having a main surface and first and second side edges;

said first side edges of said panel members being formed to provide a recessed area and said second side edges of said panel members being formed to provide a tongue area, said tongue area being insertable in said recessed area of an adjacent structure to create a baffle effect for inhibiting the passage of air therebetween, while also providing a clearance between said tongue and recess areas sufficient to permit limited relative movement between adjacent structures;

each of said first side edges including a return bend portion adjacent said main surface, an inwardly projecting portion extending from said return bend portion and a reverse bend portion extending from said inwardly projecting portion;

each of said second side edges including an inwardly offset and inclined portion adjacent said main surface, a U-shaped portion extending from said inwardly offset and inclined portion, an inwardly projecting portion extending from said U-shaped portion and a reverse bend portion extending from said inwardly projecting portion;

a pair of wooden stile members, each disposed between and at opposite ends of said panel members and adhesively bonded thereto;

a unitary expanded core fabricated of a heat insulating media interiorly disposed between said wooden stile members and said panel members and adhesively bonded to said panel members, the reverse bend portions on the first side edges being spaced from each other, and the reverse bend portions on the second side edges being spaced from each other and together with said expanded core the said spaced reverse bend portions acting to prevent direct contact between the first and second panel members;

retainer means operatively associated with said reverse bend portions of said first and second side edges for securing said first and second panel members together along said first and second side edges; and

reinforcement means of generally C-shaped cross-section, nestingly received and secured interiorly of said panel members along said first and second side edges, for reinforcing said panel members at said hinges;

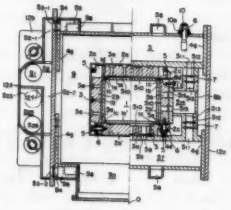
said retainer means being characterized by a plurality of alternately facing generally L-shaped deformable finger formed in said reinforcement means for confining said reverse bend portions of said first and second side edges.

4,518,027

MOLD ADAPTED TO HOUSE ELECTROMAGNETIC STIRRER COIL FOR CONTINUOUS CASTING EQUIPMENT

Futoshi Kamei, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 248,209, Mar. 27, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,806
Claims priority, application Japan, Mar. 29, 1980, 55-40728
Int. Cl.³ B22D *11/04*
U.S. Cl. 164—435 **5 Claims**



1. A mold for continuous casting of a magnetic metal, said mold comprising:

(a) a thin copper mold wall in the form of a quadrangular prism formed of four planar copper plates, two opposing ones of said four planar copper plates having flange-shaped projections extending perpendicularly from the ends of said two opposing ones of said four planar copper plates in facing relationship and the other two of said four planar copper plates, which are also in opposing relationship to one another, abutting against the end surfaces of said flange-shaped projections;

(b) a backup piece in the form of four backup plates fastened together at their sides, said backup piece being formed of a non-magnetic material serving to support said thin copper mold wall, a backup portion of a first two of said four backup plates abutting and giving direct planar support to said two opposing ones of said four planar copper plates and being slightly shorter than said two opposing ones of said four planar copper plates and a second two of said four backup plates abutting and giving direct planar support to said other two of said four planar copper plates and to the outer edges of said flange-shaped projections on said two opposing ones of said four planar copper plates, said second two of said four backup plates overlapping the ends of said first two of said four backup plates in engaging relationship;

(c) passageways for a cooling medium between said thin copper mold wall and said backup piece;

(d) a clamping piece in the form of a pair of clamping frames for clamping said backup piece against said thin copper mold wall;

(e) an electromagnetic stirrer coil located between said backup piece and said clamping piece;

(f) fastener bolts mounted on each end of each backup plate for fastening each adjacent pair of said backup plates together, each bolt having spring means which allows for limited movement of each of said backup plates perpendicularly to each of the adjacent ones of said backup plates; and

(g) tie rods having spring means for fastening said clamping frames together so as to allow for limited movement of said clamping frames relative to each other.

4,518,028

PROCESS AND APPARATUS FOR OBTAINING STACKABLE AUTO-CLAMPING BLOCKS

Francois Bucourt, St. Jean de Maurienne, France, assignor to Aluminium Pechiney, Lyons, France

PCT No. PCT 1 FR 81/00055, § 371 Date Nov. 19, 1981, § 102(e) Date Nov. 19, 1981, PCT Pub. No. WO 81/03135, PCT Pub. Date Nov. 12, 1981

This PCT application filed Apr. 24, 1981, Ser. No 325,433

Claims priority, application France, Apr. 28, 1980, 80 10116

Int. Cl.³ B22D *11/12, 11/126*

U.S. Cl. 164—460 **7 Claims**

1. A process for forming stackable autoclamping blocks from metal blocks of constant section comprising providing a rough-cast blank of a continuous casting machine of the grooved-wheel type, said blank defining lateral faces and top and bottom faces, periodically connecting the blank solidly to an apparatus for dividing it into blocks, characterized by the steps of progressively pinching the blank on its lateral faces in order to form depressions in the lateral faces, and to develop on at least one of the top and bottom faces at least one projection rising above the plane of the one face to the height of the order of 1/10 of the height of the blank, and then cutting the blank across the depression and through the medial plane of the projection to form individual blocks, and having a portion of said projection adjacent the respective ends of the individual blocks.

4,518,029

METHOD OF AND APPARATUS FOR PRODUCING THIN METALLIC SHEET BY RAPID COOLING

Kiyoshi Shibuya; Takahiro Kan, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Nov. 26, 1982, Ser. No. 444,518

Claims priority, application Japan, Dec. 4, 1981, 56-195789

Int. Cl.³ B22D *11/00, 11/06, 11/124*

U.S. Cl. 164—463 **8 Claims**

1. A double roll type method of producing a thin sheet by rapid cooling, comprising the steps of:

pouring molten metal into a kissing region between a pair of cooling rolls rotating in opposite directions;

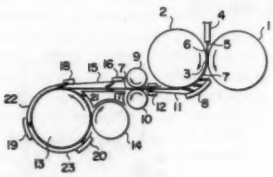
rapidly cooling and solidifying the molten metal into a thin sheet while said molten metal passes through said kissing region;

applying a cooling gas to the thin sheet coming out of said kissing region to further cool the thin sheet and to deflect the thin sheet towards a surface of one of said cooling rolls so as to bring the thin sheet in contact with said surface of said one of said cooling rolls; and

imparting a tension to the thin sheet by a pair of pinch rolls disposed at a downstream side of a position of application of said cooling gas, whereby the thin sheet is kept in close contact with said surface of said one of said cooling rolls over a predetermined region in a circumferential direction of said surface.

3. A double roll type apparatus for producing a thin sheet by rapid cooling, comprising:

a pair of cooling rolls rotating in opposite directions forming a kissing region between said cooling rolls wherein a molten metal is poured into said kissing region and the molten metal is rapidly cooled and solidified to become a thin sheet as it passes through said kissing region;



a gas applying header disposed downstream from and in the vicinity of said kissing region to apply a cooling gas to a surface of said thin sheet so as to deflect said thin sheet towards one of said cooling rolls; and

a pair of pinch rolls disposed downstream from said gas applying header, said pinch rolls rotating in synchronism with said cooling rolls thereby to impart a tension to said thin sheet, whereby said gas applying header and said pinch rolls cooperate with each other in deflecting said thin sheet into close contact with the surface of said one of said cooling rolls over a predetermined region in the circumferential direction of said cooling roll, thereby to further cool said thin sheet rapidly.

4,518,030

MULTI-TURN COILS OF CONTROLLED PITCH FOR ELECTROMAGNETIC CASTING

Gerhart K. Gaule, Elberon, N.J.; John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 193,852, Oct. 3, 1980, abandoned, which is a continuation of Ser. No. 009,429, Feb. 5, 1979, abandoned. This application Jun. 24, 1982, Ser. No. 391,631

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—503 **12 Claims**

1. In an apparatus for electromagnetically casting molten material into an ingot of desired shape comprising:

means for receiving and electromagnetically containing and forming said molten material into said ingot, the improvement wherein:

said means for receiving and electromagnetically containing and forming said molten material comprises a variable-pitch multi-turn inductor,

said inductor comprising at least three individual turns arranged in a stacked relationship with each turn being oriented parallel to each other such that the center line through the mid-point of each turn is substantially perpendicular to the longitudinal axis through the inductor in the direction of casting;

said at least three individual turns further arranged with the pitch between said turns having a value of $a_{(z)}$ defined substantially by the formula:

$$a_{(z)} = a_o \sqrt{\frac{h - z}{h}}$$

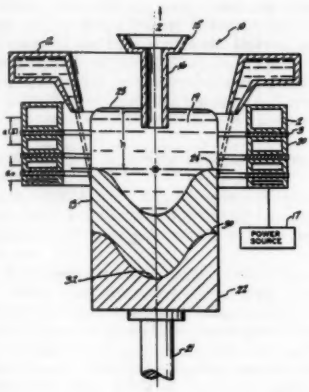
wherein

$a_{(z)}$=the pitch or spacing between inductor turns at a height z above the solidification interface

a_o=the pitch or spacing between inductor turns at the solidification interface

h=the total molten material head

z=the height above the solidification interface;



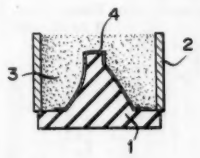
said individual turns being electrically connected in series and being spaced apart from each other by individual insulating spacers whereby an electromagnetic field is generated being substantially uniform in a transverse direction and non-uniform in a longitudinal direction.

4,518,031

METHOD FOR MAKING MOLDS

Akio Yamanishi, and Kanichi Sato, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,767
Int. Cl.³ B22C *1/22, 9/00*
U.S. Cl. 164—526 **3 Claims**



1. A method for making a mold, comprising the steps of:

forming a pattern with a material which allows microwave radiation to pass therethrough;

coating said pattern with a liquid facing agent by dipping or spraying, said liquid facing agent including a dielectric material to microwave radiation, 5–20 parts by weight of a thermosetting resin based on 100 parts by weight of refractory material powders, and refractory material powders;

covering said coated pattern with a molding material including a thermosetting resin and dielectric material to microwave radiation, the dielectric material containing therein at least one substance selected from the group consisting of iron oxide, graphite and magnetite;

exposing said molding material covered pattern to microwave radiation for a time sufficient to harden said molding material by heat generated therein; and

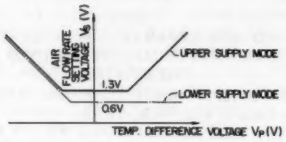
separating said pattern from said hardened molding material.

4,518,032

TEMPERATURE CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONING SYSTEMS

Ken Funasaki; Toshiki Iijima, both of Katsuta, and Tsuneo Kagohata, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,637
Claims priority, application Japan, Nov. 11, 1981, 56-179719; Feb. 24, 1982, 57-27307; Feb. 24, 1982, 57-27317
Int. Cl.³ F24F *7/00*; B60H *1/00, 3/00*; B61D *27/00*
U.S. Cl. 165—12 **15 Claims**



1. In an air conditioning system for automobiles including air flow rate control means for controlling the rate of air flow from a blower in accordance with the difference between a preset vehicle compartment temperature established by temperature setting means and an actual vehicle compartment temperature detected by an inside air sensor, a temperature control apparatus comprising:

first means for detecting that said air conditioning system is at a heating operation; and

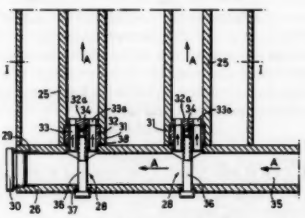
second means operable in response to a signal generated from said first means during said heating operation whereby said rate of air flow is maintained at a predetermined flow rate below a maximum flow rate of blower irrespective of the difference between said preset temperature and said vehicle compartment temperature when said difference exceeds a predetermined value.

4,518,033

DEVICE FOR CONTROLLING THE TEMPERATURE OF ROOMS IN A BUILDING

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Josef Gartner & Co., Gundelfingen, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,149
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904005; Apr. 4, 1979, 2913598
Int. Cl.³ F24D *5/10*
U.S. Cl. 165—53 **16 Claims**



1. Temperature control apparatus defining a flow passage for a heat exchange fluid for use in conditioning the temperature of a building or portion thereof comprising elements including a pair of adjacent elements each defining a segment of a flow passage, the segment provided by one of said adjacent elements being substantially perpendicularly related to and having one end portion thereof in communication with the segment of said flow passage provided by the other, an insert fixed in and in bridging relation to said one end portion of said segment of said flow passage provided by said one of said adjacent elements, said insert being essentially clear of the

segment provided by the other of said adjacent elements and having therein a plurality of parallel apertures directed through and axially thereof for passage of fluid from one segment of said flow passage provided by one of said adjacent elements to the segment of the flow passage provided by the other thereof, and means applied to said insert and said other of said adjacent elements to provide an interconnection thereof to maintain a fixed but releasable connection of said adjacent elements and a desired relative orientation of the respective segments of said flow passage provided by said adjacent elements.

4,518,034

METHOD AND APPARATUS FOR MANUFACTURING CABLES HAVING COMPOSITE SHIELD AND ARMOR SHEATH DESIGNS

David E. Vokey, Hickory, N.C., assignor to Canada Wire and Cable Limited, Don Mills, Canada

Filed Aug. 8, 1983, Ser. No. 521,372
Claims priority, application Canada, Aug. 10, 1982, 409130
Int. Cl.³ H01B *13/22*
U.S. Cl. 156—54 **15 Claims**

1. A process for manufacturing a cable having a composite shield and armour sheath design comprising the steps of:

(a) bonding a plastic coated aluminum tape to a wider steel tape with one edge of the aluminum tape registering with one edge of the steel tape and the other edge of the aluminum tape spaced inwardly of the other edge of the steel tape to define an uncovered portion of the laminated tape;

(b) corrugating the laminated tape;

(c) forming the corrugated laminated tape around a cable core with the uncovered portion of the laminated tape overlapping the registered edges of the laminated tape so as to provide a uniform unwelded overlap; and

(d) extruding an outer jacket of polyethylene over the corrugated laminated tape.

9. An apparatus for manufacturing a cable having a composite shield and armour sheath design comprising:

(a) means for bonding a plastic coated aluminum tape to a wider steel tape with one edge of the aluminum tape registering with one edge of the steel tape and the other edge of the aluminum tape spaced inwardly of the other edge of the steel tape to define an uncovered portion of the laminated tape;

(b) means for corrugating the laminated tape;

(c) means for forming the corrugated laminated tape around a cable core so that the uncovered portion of the steel tape overlaps the registering edges of the laminated tape so as to provide a uniform unwelded overlap; and

(d) means for extruding an outer jacket of polyethylene over the corrugated laminated tape.

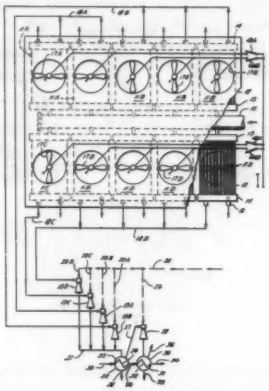
4,518,035

AIR-COOLED, VACUUM STEAM CONDENSER

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Feb. 14, 1983, Ser. No. 465,815
Int. Cl.³ F28F *27/02*; F28B *3/00, 9/10*
U.S. Cl. 165—101 **2 Claims**

1. An air-cooled, vacuum steam condenser, comprising a plurality of tube bundles each having an inlet header for introducing steam into one end of the tubes, and an outlet header at the other end of the tubes of each bundle from which condensate may be removed, fans for causing air to pass over the tubes of the bundles and arranged with the bundles as first and second sets of fan cells, having respectively greater and lesser numbers of fans, means for removing non-condensible gases from the outlet headers of the bundles, including first manifold means common to the outlet headers of the first set of fan cells, second manifold means common to the outlet headers of the second set of fan cells, first and second independent non-condensible gas removal means connected, respectively, with said first and second manifold means for discharging the non-condensible gases therein to the atmosphere at a pressure which prevents backflow into the manifold means, and means for



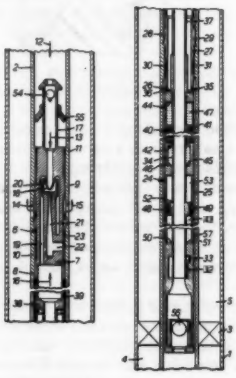
turning the fan or fans of each set on or off independently of the fan or fans of the other set, whereby the total air flow through the tubes of the bundles of said sets may be controlled by selectively turning the fans of both sets on or off, or turning the fan or fans of one set on and those of the other set off, without interfering with the non-condensible gas removal means connected with other sets.

4,518,036

DEVICE FOR CONTROLLING A SAFETY VALVE DISPOSED BELOW AN ACTIVATION PUMP IN A HYDROCARBON PRODUCTION WELL

Herve M. Lefebvre, par Chartres, and Paul M. Helderle, Verneuil-l'Etang, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 1, 1982, Ser. No. 445,779
Claims priority, application France, Dec. 2, 1981, 81 22542
Int. Cl.³ E21B *34/08, 43/12*
U.S. Cl. 166—105 **6 Claims**



1. An oil well installation including an elongate cylindrical casing (1), an elongate cylindrical production pipe (2) concentrically disposed within the casing and inwardly spaced therefrom, and annular packer means (3) sealingly disposed between

the casing and the pipe to isolate annular spaces both above (5) and below (4) the packer means, comprising:

(a) a pump (6) disposed within the pipe above the packer means, said pump being driven by pressurized liquid applied to the pipe from above to pump oil from below the pump upwardly through the annular space above the packer means,

(b) a safety valve (24) disposed within the pipe below the pump and including biasing means for normally closing said valve to seal off the pipe and thereby guard against pressure eruptions from below,

(c) a rigid, elongate, vertically movable operating member (34) slidably disposed within the valve and operable, when driven downwardly, to open the valve against the force of the biasing means,

(d) means (40, 43) for urging the operating member in an upwardly direction,

(e) piston means slidably disposed within the pipe at the level of the pump and movable downwardly in response to the application of pressurized pump driving liquid to said pipe, and

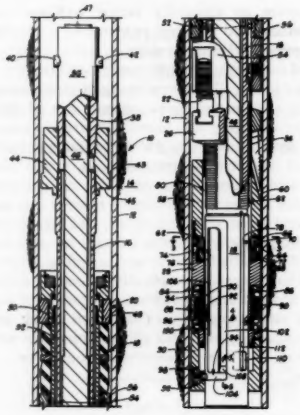
(f) rigid elongate connection means (37) secured to the piston means and depending downwardly therefrom for operatively engaging the operating member, whereby the downward movement of the piston means in response to the application of pressurized pump driving liquid to the pipe serves to drive the operating member downwardly within the safety valve to open said valve and enable pumping, and the cessation of said pressurized driving fluid enables the urging means to raise the operating member, the connection means and the piston means to thereby automatically close the safety valve.

4,518,037

RETRIEVABLE WELL TOOL

Harold C. Youngblood, Rte. 1, Box 170 - Ivanhoe, Woodville, Tex. 74979, and Kenneth L. Champeau, 8204 NW. 90th Ter., Oklahoma City, Okla. 73132

Filed Dec. 10, 1981, Ser. No. 329,181
Int. Cl.³ E21B *33/129*
U.S. Cl. 166—125 **19 Claims**



1. Apparatus for use in a well casing comprising,

a body;

slip means mounted on said body having a retracted and an expanded position;

drag means slidably mounted on said body adjacent said slip means for longitudinal and for radially inner and outer movement, said drag means being movable from a first longitudinal position to a second longitudinal position to shift said slip means into an expanded position for engagement with the well casing;

first means for maintaining said drag means in its first longitudinal position and in its radially inner position including shear bolt means; and

second means for maintaining said drag means in its first longitudinal position including lug and channel means.

4,518,038

METHOD OF EXTRACTING AND REUTILIZING SURFACTANTS FROM EMULSIONS USING SULFONATED ALKYL BENZENES AND ETHOXYLATED PHENOLS

Jim Maddox, Jr., and Vernon H. Schievelbein, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 7, 1983, Ser. No. 559,076
Int. Cl.³ E21B *43/22, 43/40*
U.S. Cl. 166—266 **21 Claims**

1. A method for extracting and concentrating enhanced oil recovery surfactants into a relatively small volume surfactant-rich middle phase from produced emulsions comprising oil, water and surfactant, which comprises:

mixing a produced emulsion with an extracting compound solution of water containing about 0.3% to about 6.0% of a first extracting compound selected from the group consisting of the alkali metal salts and ammonium salts of propyl benzene sulfonate, cumene sulfonate, ethyl benzene sulfonate, methyl ethyl benzene sulfonate, diethyl benzene sulfonate, methyl propyl benzene sulfonate, xylene sulfonate and dicyclopentadiene sulfonate;

allowing the mixture of produced emulsion and first extracting compound solution to separate into at least three phases, including a substantially surfactant-free and water-free crude oil phase, a first relatively low volume middle phase containing surfactant, oil and water, and an oil-free aqueous phase;

mixing about a 0.1% to about 3.0% volume of a second extracting compound per volume of first middle phase with said first middle phase, said second extracting compound consisting of an ethoxylated phenol with an average of about one to about fifteen ethylene oxide groups and having an alkyl side chain containing 0 to about 12 carbon atoms; and

allowing the mixture of first low volume middle phase and ethoxylated phenol to separate into at least two phases, including a substantially surfactant-free and water-free crude oil phase, a second relatively small volume surfactant-rich middle phase containing surfactant, oil and water, and usually, a third oil-free aqueous phase.

4,518,039

METHOD FOR TREATING SUBTERRANEAN FORMATIONS

John W. Graham, Rte. 5, Box 289, Alvin, Tex. 77511, and A. Richard Sinclair, 2903 Virginia, Houston, Tex. 77098

Continuation-in-part of Ser. No. 294,813, Aug. 20, 1981, abandoned. This application Oct. 27, 1982, Ser. No. 437,431
Int. Cl.³ E21B *43/04, 43/267*
U.S. Cl. 166—276 **10 Claims**

1. A method of treating a subterranean formation which comprises placing in or adjacent said formation a quantity of free-flowing, heat curable, resin coated particles comprising high strength centers, a first coupling agent chemically reacted with said centers prior to coating, a novolac resin having a second coupling agent incorporated therein coated over said centers, whereby said coupling agents provide increased resin-center bond strength, and a cross linking agent; and causing said free-flowing particles to cross-link in or adjacent said formation and form a cohesive mass.

4,518,040

METHOD OF FRACTURING A SUBTERRANEAN FORMATION

James D. Middleton, Lawton, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 29, 1983, Ser. No. 509,255
Int. Cl.³ E21B *43/26, 43/27*
U.S. Cl. 166—307 **20 Claims**

1. A method of increasing the production of fluids from a subterranean formation containing clay comprising:

(a) contacting said formation at sufficient pressure to initiate a fracture in said formation with an aqueous fluid comprising fluoride ions and allowing said fluid to leak off into the formation matrix wherein said fluoride ions are selected from the group consisting of ammonium fluoride, ammonium bifluoride, and mixtures thereof;

(b) contacting said formation at sufficient pressure to extend said fracture with a first aqueous viscous fluid comprising a gelling agent and hydrogen ions;

(c) contacting said formation at a pressure sufficient to maintain said fracture with a second viscous fluid comprising a gelling agent, hydrogen ions, and a propping agent; and,

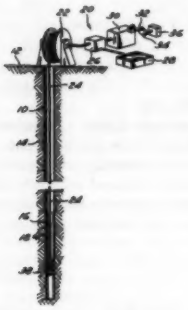
(d) reducing the pressure on the formation to allow the aqueous fluid of step (a) to flow from the formation matrix into the fracture to form hydrofluoric acid whereby said hydrofluoric acid removes fines dispersed in the fracture face or the propping agent.

4,518,041

HYDRAULIC JET WELL CLEANING ASSEMBLY USING A NON-ROTATING TUBING STRING

Casper W. Zublin, 801 Hewlett, Bakersfield, Calif. 93309

Continuation-in-part of Ser. No. 337,371, Jan. 6, 1982, Pat. No. 4,442,899. This application Mar. 22, 1982, Ser. No. 360,492
The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.
Int. Cl.³ E21B *37/00*; B08B *9/02*
U.S. Cl. 166—312 **35 Claims**



1. A system for washing pipes, comprising:

a non-rotating tubing string;

a jet carrier attached to said string such that as said carrier rotates through a given angle about the lengthwise axis of said tubing string, a portion of said tubing string will rotate through substantially the same angle, said jet carrier having a generally tubular body with a hollow center which provides a path for a fluid, said body having a central axis;

nozzles mounted to said carrier body;

means for supplying fluid under pressure to said nozzles, each of said nozzles being adapted to expel said fluid against said pipe with a force against the pipe, said force having an equal and opposite reactive force, one or more of said nozzles being mounted in said carrier body such that said reactive force is directionally offset from said carrier axis creating a twisting moment in said tubing string about said axis tending to rotate said carrier about said axis;

means for moving said carrier along the length of a pipe to be cleaned; and

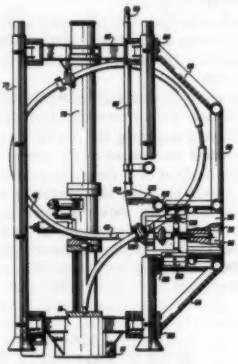
means for varying said pressure to angularly displace said carrier.

4,518,042

SUBSEA WELLHEAD CONNECTION ASSEMBLY

Henry W. Miller, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1983, Ser. No. 536,803
Int. Cl.³ E21B *43/013*
U.S. Cl. 166—347 **12 Claims**



1. A wellhead connector assembly comprising:

a support frame of tube members defining a structure for fitting onto an undersea template supported adjacent the sea bottom, said template having a plurality of positions for receiving a wellhead connector assembly, each position having an upwardly facing wellhead connection outlet means and a lateral penetration connector spaced therefrom and along one side;

a wellhead connector at the bottom of said support frame for engaging said wellhead connection outlet means;

a manifold system connector on one side of said support frame for engaging said lateral penetration connector;

a loop of pipe carried by said support frame connecting said wellhead connector to said manifold system connector;

means on said support frame mounting said manifold system connector for lateral movement toward and away from said lateral penetration connector, said means comprising:

a bell crank pivotally mounted on said support frame adjacent and pivotally linked to said manifold system connector and to a generally vertically extending actuation rod so that upward and downward movement of said actuating rod causes pivoting of said bell crank and lateral movement of the manifold system connector toward and away from said lateral penetration connector.

4,518,043

TOOL APPARATUS WITH CONTROL TO MOVE TOOL WHEN OBJECT APPROACHED

Jack F. Anderson, Marion, N. Dak. 58466; Clayton Melrose, Oakes, N. Dak., and Floyd Melrose, Brookings, S. Dak., assignors to Jack F. Anderson, Marion, N. Dak.

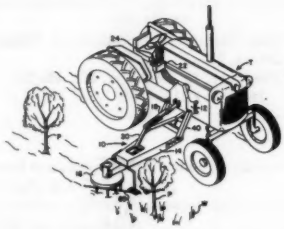
Filed Aug. 9, 1982, Ser. No. 406,318
Int. Cl.³ A01B *65/02, 13/04*; A01D *35/00*
U.S. Cl. 172—6 **23 Claims**

12. In tool apparatus having a tool, a main frame and revers-

ible hydraulic powered motion producing means for moving the tool in one direction with respect of said main frame and in the opposite direction in response to the proximity of an object to the tool, wherein the improvement comprises:

solenoid valve means having a first position adapted to direct a flow of hydraulic fluid to drive said motion producing means in one direction, a second position adapted to direct a flow of hydraulic fluid to drive said motion producing means in the opposite direction, and a third position for not directing hydraulic fluid to drive said motion producing means in any direction;

sensing means for sensing the proximity of the object to the tool;



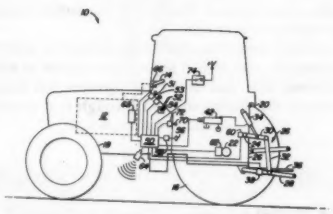
automatic switch means connected to said sensing means for directing an electric current to said solenoid valve means to move said tool in said one direction to a given distance away from said main frame whenever said tool is not within a pre-selected spacial proximity to an object, to move said tool in said opposite direction to a position less than said given distance from said main frame whenever said tool is within said pre-selected proximity to the object and approaching closer to said object, and to prevent movement in either direction whenever said tool is within said pre-selected proximity to the object and not approaching closer to the object even when said tool is less then said given distance from said main frame.

4,518,044

VEHICLE WITH CONTROL SYSTEM FOR RAISING AND LOWERING IMPLEMENT

Gordon K. Wiegardt; Thomas W. Hanks, and Carl E. Kittle, all of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 22, 1982, Ser. No. 360,748
Int. Cl.³ A01B *63/112*
U.S. Cl. 172—7 **56 Claims**



1. In a vehicle having connecting means for attaching a ground-penetrating implement thereto and actuating means for raising and lowering the implement to vary the ground penetration thereof in response to signals applied to an input thereof:

sensing means for sensing an operating parameter of a machine system comprising the vehicle, the connecting means and the implement, and for generating a parameter signal representative thereof;

set point means for deriving a parameter set point signal from the parameter signal;

difference means for generating a parameter error signal representing a difference between the parameter signal and the parameter set point signal; and

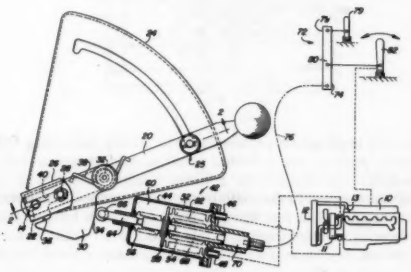
means for converting the parameter error signal to a control signal and for applying the control signal to the input of the actuating means, the actuating means being adapted to move the implement in response to the control signal.

4,518,045

VEHICLE WITH COOLANT PRESSURE RESPONSIVE HITCH CONTROL

Roger J. Nelson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 13, 1983, Ser. No. 504,002
Int. Cl.³ A01B *63/112*
U.S. Cl. 172—7 **10 Claims**



9. In a vehicle having a hitch and an engine-driven coolant pump, a hitch control system for raising and lowering the hitch, comprising:

actuator means for moving in response to a coolant pressure from the coolant pump; and

control means operatively coupled to the actuator means for raising and lowering the hitch in response to movement of the actuator means, the actuator means comprising a cylinder having a piston movable therein and connected to a rod which engages the control means, the cylinder having a first chamber communicated with an outlet of the coolant pump and a second chamber communicated with an inlet of the coolant pump, the piston and rod moving to operate the control means in response to a differential pressure between the first and second chambers.

4,518,046

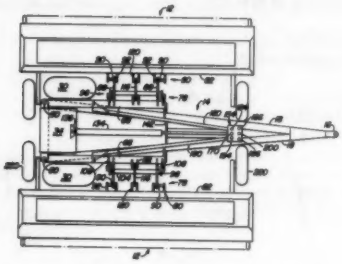
MULTIPLE IMPLEMENT HITCH AND TRANSPORT

Vernon E. Rettig, Bondurant; Marvin L. Bigbee; Ronald M. Steilen, both of Ankeny, and Glenn D. Head, Jr., Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 21, 1982, Ser. No. 390,435
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **33 Claims**

1. An implement hitch for supporting two agricultural implements side-by-side in the field, the hitch comprising: a fore-and-aft extending main frame including forward connecting means adapted for connection to a towing vehicle, a fore-and-aft extending hitch member extending rearwardly from the forward connecting means; a ground wheel assembly connected to the main frame and supporting the main frame for forward movement over the ground; first and second support arms, each arm having radially inward and outward ends; means pivotally connecting the radially inward ends of the support arms to the aft end of the main frame for swinging

about upright axes between first positions wherein the outward ends extend transversely outwardly in opposite directions from the transverse frame structure and a second position wherein the arms extend forwardly from said frame structure; vertically positionable connecting structure carried by each support arm outwardly of the respective inward end, each connecting structure adapted for receiving one of the agricultural implements; power means for positioning the connecting structure, when said implements are attached, to raise and lower the implements between a lower ground-engaging position and an upper position wherein the weight of the implements is carried primarily by the ground wheel assemblies; means for pivoting the support arms between the first and second positions to



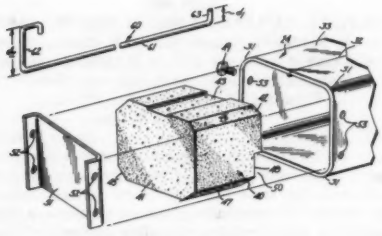
move the implements between a transversely extending field-working position and a folded position, said means including extendable and retractable cylinder means having one end fixedly connected to the main frame and an opposite end movable fore-and-aft, a pair of rigid links, each link having a forward end connected for movement fore-and-aft with the cylinder means, and a rearward end, and means connecting the rearward ends of the links to the respective arms outwardly of the inward ends of the arms for swinging the arms between the first and second positions as the cylinder means is extended and retracted; and wherein the ground wheel assembly comprises two ground-engaging wheels, one supported forwardly and transversely outwardly of each support arm pivotal connecting means.

4,518,047

TOOL BAR WITH SLIDABLY INSERTABLE BALLAST BLOCK

Richard L. Peterson, Le Sueur, and Roger J. Scheurer, Kasota, both of Minn., assignors to Hiniker Company, Mankato, Minn.

Filed Aug. 23, 1982, Ser. No. 410,653
Int. Cl.³ A01B *23/04*
U.S. Cl. 172—611 **25 Claims**



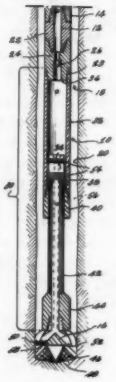
1. In an earth working implement: a tool bar having a generally rectangular inside wall defining a passage, ballast block slidably insertable into said passage of the tool bar to increase the weight of the tool bar, said block comprising a one-piece body of dense material, said body having a rectangular shape with longitudinal corners and side wall means locatable adjacent the inside wall of the tool bar whereby the body slidably fits into said passage, each of said corners having a beveled edge, said side wall means having a longitudinal groove between adjacent corners to accommodate portions of the tool bar, said body having opposite ends, one of said ends having a notch open to a corner of the body, and channel means provided by a beveled edge of one corner of the body extended from said notch in one of said ends to the opposite end thereof to accommodate a tool used to remove the body from the tool bar, and means retaining said block in said passage of the tool bar.

4,518,048

METHOD FOR IMPROVED HYDRAULIC JETTING OF DRILL BORE HOLES USING HIGH PRESSURE PULSES OF FLUID

Robert F. Varley, Metairie, La., assignor to Robert F. Varley Co., Inc., Gretna, La.

Filed Apr. 18, 1983, Ser. No. 486,220
Int. Cl.³ E21B *7/08, 7/18, 10/18*
U.S. Cl. 175—61 **4 Claims**



1. A method for drilling a well bore hole using a drill string having on its lowermost portion a drill bit having at least one fluid jetting nozzle, said method comprising:

(a) causing an object which is disintegratable by a compressional force in excess of a predetermined level to descend through a pressurized fluid in said drill string and block said at least one nozzle;

(b) increasing the level of fluid pressure acting on said object until it is crushably forced through said nozzle to cause a pulse of pressurized fluid to be thereafter jetted through said at least one nozzle; and

(c) cyclically repeating said steps (a) and (b) such that a ball is caused to seat in said at least one nozzle at substantially the same time that said fluid pressure has been reestablished by the jetting of fluid through said nozzle.

4,518,049

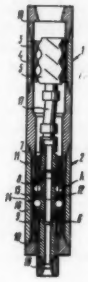
BOTTOM HOLE MOTOR FOR DRIVING ROCK-BREAKING TOOL

Dmitry F. Baldenko; Moisei T. Gusman, and Valery I. Semenets, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Tekhniki, Moscow, U.S.S.R.

Continuation of Ser. No. 261,211, May 1, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 622,381
Int. Cl.³ E21B *4/02*
U.S. Cl. 175—107 **7 Claims**

1. A bottom hole drill, comprising:
a motor unit;

a spindle unit having a housing;
a shaft extending through said housing and connected at one end to said motor unit;
radial bearings located between said housing and said shaft;
a thrust-radial bearing comprising;
a plurality of races and rings secured within said housing coaxially with said shaft,



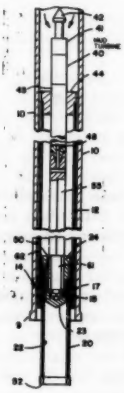
peripheral annular grooves formed on the outer surface of said shaft, and
rolling bodies provided between said races, rings, and annular grooves; and
a rock-breaking tool mounted at the other end of said shaft.

4,518,050

ROTATING DOUBLE BARREL CORE SAMPLER

Steinar Sollie, and Arild A. Andresen, both of Oslo, Norway, assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1983, Ser. No. 509,891
Int. Cl.³ E21B *25/00, 49/02*
U.S. Cl. 175—250 **5 Claims**



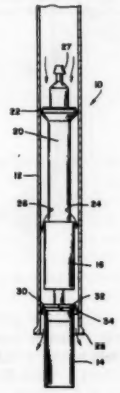
1. A wire line core sampler for use in a drill string sub comprising a cylindrical guide tube removably insertable into said sub; an outer cylindrical barrel rotatably and reciprocally mounted within said guide tube and extendable out through the lower end of said sub; a core barrel positioned within said outer cylindrical barrel; and downhole mud turbine means insertable into said drill string sub and connected to said outer cylindrical barrel and responsive to liquid pressure in the drill string for rotating said outer barrel and for extending said outer barrel and said core barrel through the lower end of said sub to take a soil sample.

4,518,051

PERCUSSION ACTUATED CORE SAMPLER

Steinar Sollie, and Arilo A. Andresen, both of Oslo, Norway, assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1983, Ser. No. 509,892
Int. Cl.³ E21B *25/00, 49/02*
U.S. Cl. 175—250 **11 Claims**



1. A wire line core sampler for use in a drill string sub comprising a drill string sub connectable to the lower end of a drill string, a core barrel insertable through said drill string into said sub and freely movable therein; hydraulic percussion means insertable through said drill string into said sub and freely movable therein operably connected to said core barrel; and downhole means responsive to drilling mud pressure for actuating said hydraulic percussion means to drive said core barrel out of the end of the drilling string sub into the material to be sampled.

4,518,052

APPARATUS FOR AUTOMATICALLY MEASURING HEIGHT

Li-Fu Chen, 4th Fl., No. 17, La. 133, Pao Pyng Rd., Yuan Ho City, Taiwan

Filed Jul. 13, 1982, Ser. No. 397,864
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.
Int. Cl.³ G01G *19/00*
U.S. Cl. 177—245 **7 Claims**

1. An apparatus for automatically measuring and displaying the height of the top of the head of a human being above a surface, comprising:
a generally vertical frame a first extremity of which is fixed to said surface;
first radiation source means, fixed to a second extremity of said frame, for directing radiation toward the top of the head of a human being standing on the surface;
sliding assembly means, slidably disposed on said vertical frame, for sliding rectilinearly along said vertical frame between said first and second extremities, said sliding assembly means including:
first radiation detecting means for detecting radiation reflected toward the frame by the top of the head of the human being; and
display means for displaying indicia of the height of the human being;
drive means, responsive to said detected radiation, for sliding said sliding assembly means along said frame toward said second extremity and for stopping said sliding assem-

bly means at a first position, said first position being determined in response to said detected radiation; and

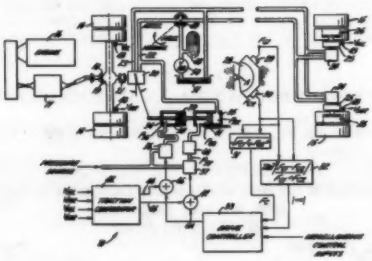
position determining means for determining the position of said sliding assembly means along said frame and for converting said determined position into said indicia of height to be displayed by said display means.

4,518,053

ARTICULATED VEHICLE DRIVE AND CONTROL SYSTEM

Gerard Queveau, Amik Farm, 79140, Le Pin, Cerizay, France

Filed Oct. 22, 1982, Ser. No. 436,177
Int. Cl.³ B62D *47/02*
U.S. Cl. 180—14.2 **15 Claims**



1. A method of propelling an articulated vehicle having a forward section and a rear section connected at an articulation connection, the vehicle having a source of driving power, the rear section having a first set of wheels driven through a differential by the source of driving power, the differential having a variable displacement hydraulic pump mounted thereon, the forward section having a second set of wheels for steering the vehicle and a third set of wheels, each wheel in the third set of wheels being selectively drivable through a respective overrunning clutch by a respective fixed displacement hydraulic motor, the hydraulic motors being connected by hydraulic lines to the hydraulic pump, the articulation connection transmitting a connection force between the forward and rear sections, the method comprising:

monitoring parameters with at least one transducer having an output from which values for the instantaneous angle of articulation between the sections and the magnitude of the connection force may be derived;

determining a torque control signal as a predetermined increasing function of the magnitude of the instantaneous angle of articulation and magnitude of the connection force, and

using the torque control signal to achieve a predetermined differential pressure across the hydraulic motors by adjusting the hydraulic pump displacement, whereby the torque applied to the third set of wheels is an increasing function of the magnitude of the instantaneous angle of articulation and magnitude of the connection force,

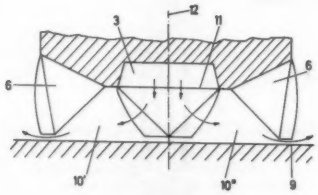
whereby independent of the speed of the vehicle, when the first set of wheels slip, tending to cause a jackknifing situation, the hydraulic pump increases its flow of hydraulic fluid to the motors, thereby increasing the speed of the hydraulic motors relative to the speed of the third set of wheels, whereupon the overrunning clutches are engaged and the third set of wheels are driven to prevent the jackknifing situation.

4,518,054

AIR CUSHION VEHICLE PROVIDED WITH A LIFT SYSTEM WITH AUTOMATIC TRANSVERSAL AIR DISTRIBUTION

D. Mariano de la Cruz Toran, La Rinconada B-6, Madrid 23, Spain

Filed Mar. 2, 1983, Ser. No. 471,526
Claims priority, application Spain, Mar. 18, 1982, 510603
Int. Cl.³ B60V *1/12*
U.S. Cl. 180—118 **12 Claims**



1. An air cushion vehicle provided with a lift system with automatic transversal air distribution, comprising:

a rigid body structure having internal channels for air distribution;

a lift system including one or more lift fans;

flexible skirts provided on said rigid body structure for distributing and retaining air in an air cushion chamber defined by said flexible skirts;

a propulsion system;

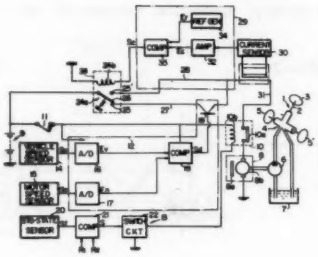
drive means for driving said lift fans and said propulsion system; and

flexible keel means, provided on the bottom of said rigid body structure, for dividing said air cushion chamber into at least two longitudinal supporting semichambers, directing the air in the internal channels towards said semichambers, varying the air flow to said semichambers according to a difference in pressure between the said semichambers so as to automatically direct the lift air to one of said semichambers, thereby creating a righting or stabilizing moment the value of which depends on the output pressure of the fans with minimum loss of pressure so that the lift air flowrate required is minimum for a given stability.

4,518,055
PUMP-DRIVE DEVICE OF POWER-ASSISTED STEERING SYSTEM

Eiji Yagi, Ayase; Yuji Kobari, and Sadahiro Takahashi, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 11, 1983, Ser. No. 474,425
Claims priority, application Japan, Apr. 8, 1982, 57-59417; Jun. 22, 1982, 57-93359[U]; Jun. 22, 1982, 57-93360[U]
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—142 24 Claims



1. A pump-drive device of a power-assisted steering system for an automotive vehicle, the steering system including a steering wheel operatively connected to a steering gear assembly and a steering pressure pump to supply fluid pressure to the steering gear assembly for reducing a manual steering effort applied to the steering wheel, comprising:

electric drive means operative to drive said steering pressure pump when electrically actuated;

first sensing means for detecting driving speed of the vehicle and producing an output signal representative of the detected vehicle speed;

second sensing means for detecting the output speed of said drive means and producing an output signal representative of the detected output speed of the drive means;

a current control circuit responsive to the respective output signals from the first and second sensing means;

a main current supply line electrically connected between a power source and said drive means through said current control circuit;

a bypass current supply line electrically bypassing said current control circuit between the power source and said drive means;

said current control circuit being operative to produce an output signal effective to vary the current to be passed through said main current supply line on the basis of the respective output signals from said first and second sensing means;

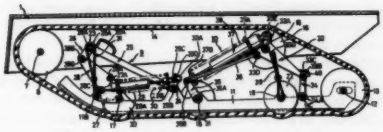
detecting means responsive to a predetermined operative condition of the steering system and operative to produce an output signal when the steering system is in the predetermined operative condition; and

line shifting switch means intervening between said power source and each of said main and bypass current supply lines and operative to provide electrical connection between said power source and said drive means selectively through the main current supply line in the absence of the output signal from said detecting means and through said bypass current supply line in the presence of the output signal from said detecting means.

4,518,056
SNOWMOBILE

Takashi Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jul. 29, 1982, Ser. No. 403,064
Claims priority, application Japan, Aug. 11, 1981, 56-124799
Int. Cl.³ B62D *55/08*
U.S. Cl. 180—193 5 Claims

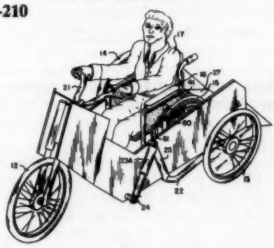


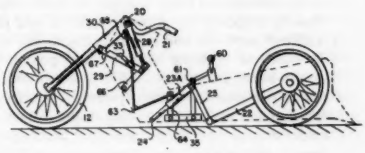
1. A suspension system for a snowmobile comprising a body frame, a slide rail, front and rear suspension means securing said slide rail to said body frame for movement relative thereto, an endless track arranged and disposed to run on a driven roller mounted on said slide rail and a drive pulley mounted on said body frame, said front and rear suspension means comprising link means connecting said side rail to said body frame, and shock absorbing means connected between portions of said link means which pivot in directions opposite to one another whereby said shock absorber is extended or compressed when said link means pivots, at least one of said shock absorber means comprising a tubular shock absorber having its opposite ends operatively supported by said side rail, said link means being operative to effect movement of each of said shock absorber means ends toward the other upon movement of said slide rail toward said body frame.

4,518,057
WHEELCHAIR TRANSPORTING WITH SELECTIVELY RAISABLE PLATFORM MEANS

Michael McCallum, 431 W. Oakdale, Chicago, Ill. 60657

Filed Jun. 8, 1983, Ser. No. 502,316
Int. Cl.³ B62K *15/00*
U.S. Cl. 180—210 18 Claims





1. Wheelchair carrying apparatus operable for entry and exit by the wheelchair operator without assistance and for transport with the wheelchair operator seated in the wheelchair and being transported thereby, comprising,

platform means having a front and rear for supporting a wheelchair with the operator therein,

first and second rear wheel means to the side of and separated by said platform means for rollably supporting said platform means,

platform support means for supporting said platform means and said rear wheel means while allowing relative vertical displacement between said rear wheel means and said platform means between a riding position with said platform means substantially horizontal a first predetermined height above a surface supporting said rear wheel means and an access position substantially horizontal a second predetermined height above said surface less than said first predetermined height,

steerable front wheel means for rollably supporting said platform means for movement along a steered direction,

steering control means coupled to said front wheel means accessible to a wheelchair operator seated in a wheelchair when on said platform means for controlling steering direction,

and actuating means intercoupling said platform means and said platform support means for selectively raising said lowering said platform means and thereby selectively positioning said platform means in said riding and access positions.

4,518,058

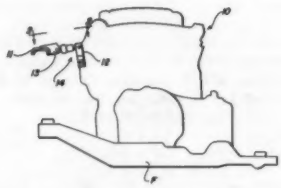
ENGINE TORGUE RESISTING STRUT AND VIBRATION DAMPER

Louis P. Fister, St. Louis; Herby O. Pearson, Chesterfield, both of Mo., and Lawrence H. Fitch, Cahokia, Ill., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Dec. 21, 1981, Ser. No. 332,550

Int. Cl.³ B60K *5/12*

U.S. Cl. 180—300 **10 Claims**



1. In a vehicle having a frame and an engine carried in the frame in a predetermined position, the improvement of a passive engine torque resisting strut and vibration damper between the engine and the frame comprising:

(a) a housing having a closed end and means at said closed end providing a pivotal attachment for the engine and a closure mounted at the opposite end of said housing;

(b) a piston slidably received in said housing;

(c) a piston rod connected to said piston and slidably passing through said closure to the exterior of said housing;

(d) resilient attachment means on the piston rod for connection to the frame;

(e) a predetermined fixed quantity of hydraulic fluid in said housing disposed on opposite sides of said piston;

(f) resilient means in said housing in addition to said hydraulic fluid on opposite sides of said piston, said resilient means being assembled in said housing under a predetermined pre-load for normally centering said piston in said housing and yieldably resisting displacement of said piston under engine operating conditions tending to change the spacial distance between the engine and frame where the torque strut is attached, and the hydraulic fluid being transferred within said housing between opposite sides of said piston upon the displacement of said piston; and

(g) hydraulic fluid transfer compensation means carried by said housing in position to communicate with said housing interior between said piston and said closed end of said housing, said compensation means accommodating the transfer of hydraulic fluid, in response to piston movement in said housing toward and away from said closed end of said housing, and including a wall having a port for fluid flow between said housing and said separate space, a compressible body in said separate space, and a protective surface between said compressible body and said port to receive the impact of the hydraulic fluid flow into said separate space.

4,518,059

ATTACHMENT FOR THE BOOMS OF CRANES OR THE LIKE

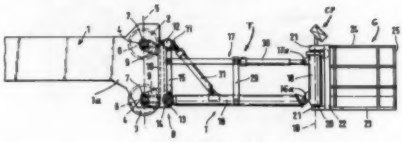
Paul Frey-Wigger, Am Zeigerwald, CH-6247 Schötz, Switzerland

Filed Jul. 7, 1983, Ser. No. 511,667

Claims priority, application Switzerland, Jul. 12, 1982, 4222/82

Int. Cl.³ B66F *11/04*

U.S. Cl. 182—2 **20 Claims**



1. An attachment for the end portion of an elongated boom in a crane or an analogous machine wherein the boom is movable between a plurality of positions and/or can be caused to change its length, comprising a carrier having a first and a second end portion; means for coupling said first end portion to the end portion of the boom so that the carrier is pivotable about a first axis, which is at least substantially normal to the longitudinal direction of the boom, to and from a predetermined position of at least substantial parallelism with and adjacent to one side of the boom; a collapsible gallery; and means for connecting the gallery to said second end portion for pivotal movement about a second axis which is at least substantially parallel to said first axis so that the gallery is movable to a position in which it is adjacent to said one side of the boom.

4,518,060

SUPPORT FOR HAND AND KNEE AT WORK ON LOW LEVEL

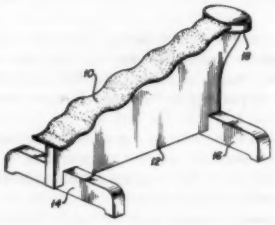
Emil Natchev, Upplandsgatan 50, Stockholm, Sweden

Filed Mar. 28, 1983, Ser. No. 479,180

Claims priority, application Sweden, Sep. 8, 1982, 822145

Int. Cl.³ A47C *9/00*

U.S. Cl. 182—230 **3 Claims**



1. A support for hand and knee to be used when working at low level, comprising a vertical, substantially triangular disc (12) having a sloping upper side of wave shape, a soft liner (10) preferably from rubber cloth, which is attached to said upper side of said disc (12), and feet (14, 16) associated with the

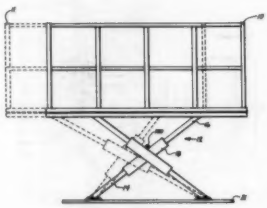
bottom side of said disc (12) and directed perpendicularily to said disc (12) for carrying said disc in a vertical position, and, at the uppermost end of said disc (12) a rest disc (18) for the hand at same level or at a higher level than the uppermost part of the soft liner (10).

4,518,061

TRANSLATING MOBILE WORK PLATFORM

Donald T. Wehmeyer, Roselle, and Ronald W. Barnhart, Elmhurst, both of Ill., assignors to Economy Engineering, Inc., Bensenville, Ill.

Filed Apr. 27, 1983, Ser. No. 489,039
Int. Cl.³ B66B *11/04*
U.S. Cl. 187—18 **5 Claims**



2. An improved lift mechanism comprising:
(a) a base member;
(b) a support platform arranged above said base in substantially parallel orientation for movement with respect to said base;
(c) a scissors mechanism comprising a first and a second telescoping arm, each comprising:
(i) a lower member hingedly connected at one end to said base, and having its other end confined for relative translational motion,
(ii) an upper member hingedly affixed at one end to said platform and having its other end confined for relative translational motion,
(iii) an intermediate member arranged to confine said lower and said upper members for relative translational motion,
(iv) means for displacing said intermediate member with respect to said base member, and
(v) means for equalizing the motion of the lower and upper members relative to said intermediate member comprising:
a pulley member rotatively attached to the lower end of said intermediate member; and
a flexible tensile member securely attached at one end to said confined end of said lower member, passing under and in supporting relation to said pulley member, and securely attached at its other end to said confined end of said upper member.

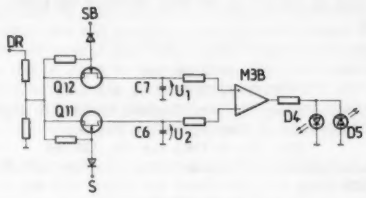
4,518,062

PROCEDURE AND MEASURING CIRCUIT FOR STOPPING AN ELEVATOR

Heimo Mäkinen, and Seppo Suur-Askola, both of Hyvinkää, Finland, assignors to Elevator GmbH, Baar, Switzerland and Kone Oy, Helsinki, Finland

PCT No. PCT/FI82/00009, § 371 Date Nov. 2, 1982, § 102(e) Date Nov. 2, 1982, PCT Pub. No. WO82/03068, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 4, 1982, Ser. No. 440,230
Claims priority, application Finland, Mar. 4, 1981, 810677
Int. Cl.³ B66B *1/30*
U.S. Cl. 187—29 R **3 Claims**

1. Procedure for adjusting the stopping of an elevator as accurately as possible by adjustment of deceleration linearity on desired level with the aid of a deceleration instruction (DR), characterized in that the elevator is run both upward and downward; comprising sampling the elevator's decelera-



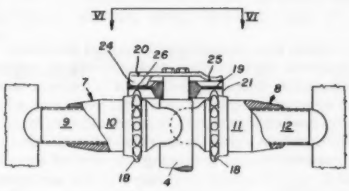
tion instruction at the beginning and end of deceleration, comparing said samples, and adjusting the linearity of said deceleration instruction based on said sampling.

4,518,063

AUTOMATIC SLACK ADJUSTER

Sven E. Camph, Flygarevägen 9 F, S-236 00 Höllviksnäs, Sweden

Continuation of Ser. No. 388,161, Jun. 14, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,253
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—196 BA **1 Claim**



1. An automatic slack adjuster for a vehicle drum brake (5) that need not be referenced to a stationary connection on the vehicle of the type actuated by a key (6) rigidly mounted on a key shaft (4) connected to a cylinder-piston activator (1), said key acting upon a pair of brake shoes (13, 14) through force transmitting devices (7, 8) each comprising two telescopically displaceable elements (9, 10, 11, 12), one being an externally threaded rod, while the other is an internally threaded sleeve receiving said rod, each of the two sleeves of the two elements being provided with a circumferential tooth rack axially adjustable along both said telescopically displaceable elements for adjusting brakes in systems having keys of different size comprising, a spring latch (20) having a dog (24) secured to the key shaft (4), a freely journalled wheel (19) mounted on one end of said key shaft and having teeth and grooves on a first shoulder surface area of one side thereof engageable with the dog (24) of said spring latch (20) and engageable on the other side with a second shoulder surface area with said circumferential tooth racks (18, 19) on said telescopically displaceable elements (7, 8) so that any straight radial movement of the tooth racks relative to said wheel (19) would cause a torque on both sleeves in the direction causing increase of the total length of the said telescopically displaceable elements, said telescopically displaceable elements having symmetric design permitting telescopic rotation in opposite directions and slack adjusting means preventing rotation of said wheel (19) relative to the key in one direction of rotation to thereby effect a torque to cause both the telescopically displaceable elements (7, 8) to increase in length together as the key (4) and wheel (10) rotate together in a direction opposite to said one direction of rotation, and wherein the means for preventing rotation of said wheel (19) includes said resilient spring latch (20), said grooves

being of such shape as to permit the dog (24) to ride over one groove and enter neighboring grooves only in one direction of rotation of the shaft (4) when the brakes are applied and to cause a torque tending to turn the wheel (19) in the opposite direction of rotation of the shaft (4) when the brakes are released.

4,518,064

CLUTCH CONTROL MEANS

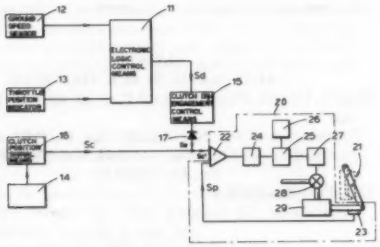
Harry M. Windsor, Harbury, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Jan. 8, 1982, Ser. No. 338,164

Claims priority, application United Kingdom, Jan. 30, 1981, 8103325

Int. Cl.³ B60K *41/22*

U.S. Cl. 192—3.58 **6 Claims**



1. A vehicle transmission clutch control including:

an electronic logic control means which is responsive to transmission operating parameters to control selection of the appropriate transmission gear ratio and which produces gear change signals to effect changes in gear ratios;

a clutch position signal means responsive to vehicle operating parameters and producing a command signal;

a clutch control means responsive to the command signal and which governs the state of engagement of the clutch;

and a clutch disengagement control means responsive to a gear change signal from the logic control means and which produces an output signal which can override the command signal and cause the clutch control means to disengage the clutch, and said output signal is caused to vary during the gear ratio change period and thereby alter the command signal and cause the state of engagement of the clutch to vary over said period.

4,518,065

AXLE DRIVE MECHANISM

Max Schuster, Passau, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,878

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117772

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—4 A **4 Claims**

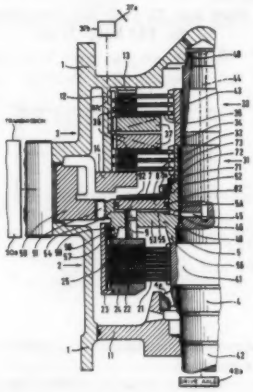
1. An axle drive mechanism for an automotive vehicle having a transmission connected to a continuously coupled axle, said drive mechanism selectively connecting another axle with said transmission, said mechanism comprising:

a drive shaft forming part of said other axle;

a drive wheel rotatably mounted on said drive shaft and operatively connected with said transmission and the selectively connected axle;

a clutch between said wheel and said shaft actuatable for rotatably coupling said wheel and said shaft to selectively engage said other axle with said wheel; and

a parking brake for said axles, said parking brake comprising a housing, said shaft being rotatable relative to said housing, first brake means between said wheel and said housing, and second brake means between said shaft and said housing, and common actuating means for both said brake means, thereby immobilizing both of said axles independently of the operation of said clutch, said housing having a pair of spaced-apart walls juxtaposed with one another and axially spaced from said clutch and said wheel, said wheel having a collar reaching axially into a spece between said walls, said first and second brake means being located between said walls and said first brake means being braced against one of said walls, said second brake



means being braced against the other of said walls, said first brake means including a first disk packet having inner disks axially shiftable but rotatably entrained on said collar of said drive wheel, and outer disks angularly fixed to said housing and axially shiftable thereon, said second brake means including a second disk packet having inner disk angularly coupled with said shaft and axially displaceable thereon, and outer disks axially displaceable on but angularly fixed to said housing, said common actuating means including a pair of plates on said housing urged apart to compress the respective disk packets.

4,518,066

SAFETY PARKING BRAKE FOR AUTOMATIC TRANSMISSIONS

William A. Barr, Gibson Island, Md. 21056

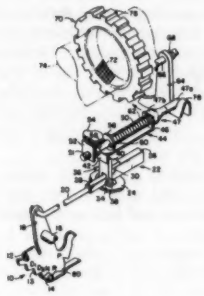
Continuation-in-part of Ser. No. 485,514, Apr. 15, 1983, abandoned. This application Sep. 2, 1983, Ser. No. 528,863

Int. Cl.³ B60K *67/00, 41/26*

U.S. Cl. 192—4 C **7 Claims**

1. In a vehicle automatic transmission of the type having a parking gear fixed to an output shaft, a pawl movable between a first position clear of said gear and a second position wherein said pawl engages said gear for parking said vehicle, means biasing said pawl to its first position, cam means for controlling the movement of said pawl between its first and second positions, and driver operated means movable between a plurality of drive including reverse positions and a park position, said reverse and park positions being adjacent to each other, the invention comprising resilient means at all times urging said cam means towards said pawl, means responsive to the movement of said driver operated means to every position except park for exerting a force on said cam means in opposition to said resilient means to stress the same and retain said cam means clear of said pawl, and means responsive to movement of said driver operated means a predetermined minimum dis-

tance towards park position to relieve said stress on said resilient means and enable it to drive said cam means against said



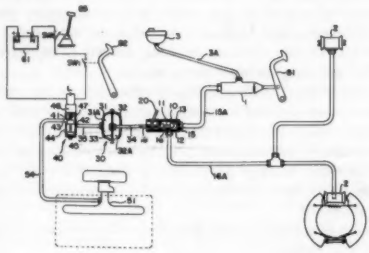
pawl to move the same from its first towards its second position.

4,518,067

AUTOMOBILE BRAKE DEVICE

Long S. Jow, and Long J. Jow, both of Taipei, Taiwan, assignors to Transtech Industrial Corporation, Taipei, Taiwan

Filed Jan. 22, 1982, Ser. No. 341,802
Int. Cl.[3] B60K *41/28*
U.S. Cl. 192—0.09 5 Claims



1. An automobile brake device, comprising:

(a) a master braking unit operable by foot and adapted to deliver a working medium for braking an automobile having wheel brakes, a clutch pedal, a transmission shift lever and an accelerator pedal,

(b) a wheel braking unit operable by said working medium to actuate said wheel brakes;

(c) a control valve having a passage through which said working medium flows between said master braking unit and said wheel braking unit and a plunger adapted to selectively open and close said passage,

(d) a toggle lever operable by hand to move from a first position to a second position, said toggle lever being provided with a resilient member and operatively connected to said plunger so that when said toggle lever is in the first position said toggle lever is urged by said resilient member to urge said plunger to be in a closed position to close said passage, and when said toggle lever is in the second position said toggle lever is urged by said resilient member to urge said plunger to be in an open position to open said passage, said toggle lever being arranged in a third position where said plunger is in said open position and remains being urged by said toggle lever and said spring toward said closed position;

(e) an actuator having a connecting rod connected to said plunger and an acting chamber to which a working means may be applied for operating said connecting rod;

(f) a solenoid valve having a solenoid to be selectively energized by electrical power and valve means operable by said solenoid, said valve means being so connected to said actuator that said working means is applied to said acting chamber through said valve means to cause said connecting rod to move in one direction when said solenoid is energized, and said working means is released from said acting chamber to allow said connecting rod to move in the opposite direction when said solenoid is de-energized; and

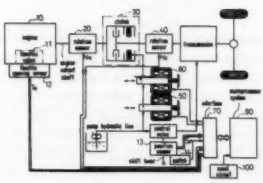
(g) a first switch and a second switch connected in series with the first switch for connecting said solenoid to an electrical power source, said first switch being caused to open when said clutch pedal is depressed and to close when the clutch pedal is released; said second switch being caused to open when said transmission shift lever is in a neutral position and to close when said transmission shift lever is in a driving gear position.

4,518,068

AUTOMATIC CLUTCH CONTROL SYSTEM

Tomio Oguma, Anjyo; Kouichiro Hirosawa, Kariya, and Tsutomu Mitsui, Chiryu, all of Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Mar. 12, 1982, Ser. No. 357,543
Claims priority, application Japan, Mar. 27, 1981, 56-45321; Mar. 27, 1981, 56-45322; Mar. 27, 1981, 56-45323; Mar. 27, 1981, 56-45324; Mar. 27, 1981, 56-45325; Mar. 27, 1981, 56-45326
Int. Cl.[3] B60K *41/28*
U.S. Cl. 192—0.052 9 Claims



1. An automatic clutch control system for a vehicle of the type having an engine for driving a drive shaft, said engine having a throttle, and said vehicle further comprising a clutch for coupling said drive shaft to a driven shaft, said system comprising:

first speed detecting means for detecting a rotational speed of said drive shaft;

second speed detecting means for detecting a rotational speed of said driven shaft;

throttle detecting means for detecting the throttle opening of said engine;

clutch engagement control means for controlling the degree of engagement of said clutch in accordance with a clutch engagement control signal; and

electronic control means coupled to said first and second speed detecting means, said throttle detecting means and said clutch control means, and including rate change detection means for determining the rate of change of said rotational speed of said drive shaft and ratio calculating means for calculating a ratio of the rotational speed of said driven shaft to the rotational speed of said drive shaft, for generating a first clutch engagement control signal repre-

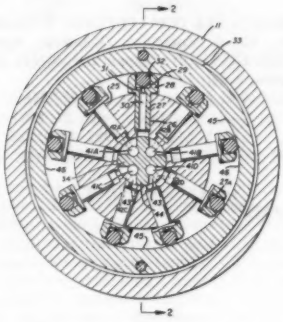
senting a small degree of engagement between said drive and driven shafts, for generating a subsequent clutch engagement control signal representing a degree of engagement upon (i) the rate of change of said drive shaft rotational speed after application of said first clutch engagement control signal, (ii) the throttle opening and (iii) elapsed time, and for thereafter generating a clutch engagement control signal representing a degree of engagement dependent upon (i) the throttle opening and (ii) the ratio of the rotational speed of said drive shaft to the rotational speed of said driven shaft.

4,518,069

ADJUSTABLE SPEED DRIVE UTILIZING RADIALLY MOVABLE HOLLOW PISTONS WHICH ACT ON A CAM SURFACE

Charles R. Elias, 19306 Scenic Harbour, Northville, Mich. 48167

Filed Nov. 1, 1982, Ser. No. 438,058
Int. Cl.³ F16D *31/02*; F04B *13/06*
U.S. Cl. 192—60 **6 Claims**



1. An improvement in an adjustable speed drive having a housing; an input rotor, an output rotor, cam surfaces on said output rotor; a plurality of bores formed in the input rotor and hollow pistons in said bores; said bores, pistons and cam surfaces arranged in radial relationship in said housing; a drive shaft on said input rotor; a driven shaft on said output rotor, said shafts having a common axis; the improvement comprising first passageways in said input rotor communicating with said bores; secondary passageways in said output rotor arranged for selective communication with said first passageways, annular chambers and communicating inlet and outlet ports in said housing, a source of fluid pressure in communication with said secondary passageways by way of said annular chambers and communicating inlet and outlet ports and valve means controlling said fluid pressure whereby said controlled fluid pressure moves said pistons radially with respect to said cam surfaces and said controlled fluid pressure selectively holds said pistons in desired position relative to said cam surfaces so as to impart controlled motion to said output rotor.

4,518,070

CLUTCH RELEASE APPARATUS FOR CHANGE SPEED TRANSMISSION

Yuzo Ooka, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,280
Claims priority, application Japan, Jun. 23, 1981, 56-96023
Int. Cl.³ F16D *25/08*; F16H *5/12*; B60K *23/02*
U.S. Cl. 192—85 CA **8 Claims**

1. A change speed gear transmission, clutch and clutch actuator device for an internal combustion engine having a crankshaft and the combination of a main shaft and a line shaft, comprising:

gear means for driving said line shaft at a plurality of speed ratios from said main shaft,

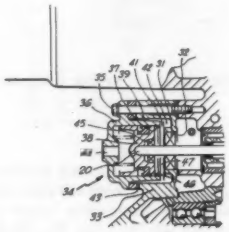
means for driving said main shaft from the crankshaft including the clutch at one end of said main shaft,

a push rod extending axially through the interior of said main shaft and operable to release said clutch,

the hydraulic actuator device at the other end of said main shaft for moving said push rod to release said clutch,

a ring member portion of said change speed gear transmission having a cavity for accepting said hydraulic actuator device, said cavity formed with a sidewall and having a bore in an end wall,

a seal ring assembly slidably receiving said push rod and positioned in said bore between said change speed gear transmission and said hydraulic actuator device,



a cylinder housing for said hydraulic actuator device sized to fit within said cavity and having an outer wall spaced from an inner wall of the cavity to provide an air space therebetween, said hydraulic actuator device having an open end of said cylinder housing spaced from the end wall of said ring member portion,

means including a vent opening for forming an air barrer between said hydraulic actuator device and said seal ring assembly, said vent opening being between said inner wall of said cavity and said outer wall of said cylinder housing whereby any leakage of hydraulic fluid exits said vent opening and does not damage said transmission and seal ring assembly,

attachment means detachably retaining said hydraulic actuator in said cavity,

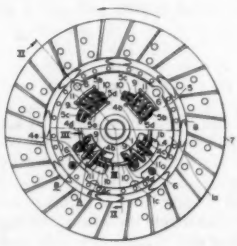
and output means for delivering power from said line shaft.

4,518,071

CLUTCH DISC HAVING DAMPER SPRINGS

Koji Nozawa, Higashikurume, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 9, 1982, Ser. No. 448,072
Claims priority, application Japan, Feb. 16, 1982, 57-23343
Int. Cl.³ F16D *3/66*
U.S. Cl. 192—106.2 **4 Claims**



1. A clutch disc comprising:

an assembly including a clutch plate having friction facings and a retaining plate joined to said clutch plate,

a spline hub having a flange which is disposed between said clutch plate and said retaining plate, said assembly and said flange of said hub being formed with a plurality of pockets circumferentially arranged around said hub, each of said pockets being formed by three openings formed, respectively, in said clutch plate, said flange, and said retaining plate, each of said openings of said assembly having an enlarged middle portion having circumferentially spaced first and second shoulders, a first elongate portion extending circumferentially from said middle portion in a normal direction in which said clutch disc normally rotates and terminating at a first end, and a second elongate portion extending circumferentially from said middle portion in a reverse direction opposite to the normal direction and terminating at a second end, the circumferential length of said first elongate portion being longer than that of said second elongate portion of each opening in said assembly, each of said openings in said flange having first and second ends circumferentially spaced at a distance equal to the circumferential distance between said first and second ends of said openings of said assembly,

damper means arranged between said assembly and said flange of said hub for transmitting torque therebetween, said damper means comprising

first damper means comprising a plurality of first damper coil springs which are arranged circumferentially around said hub and wound around an annular wire guide which is concentric with said hub and passes through all of said pockets, each of said first springs being confined between said first and second ends of said openings of said assembly in a pocket in such a manner that each of said first springs is effective over the full angular range of the relative rotational displacement between said assembly and said flange, and

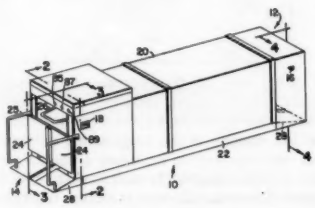
second damper means comprising a plurality of second damper coil springs having a spring constant greater than that of said first springs, each of said second springs being confined between said first and second shoulders of said openings in said assembly in one pocket in such a manner that said second springs begin to be compressed when a relative rotational displacement between said flange and said assembly exceeds a predetermined angle, each of said first springs being inserted in a respective one of said second springs with one end projecting from one end of that second spring and the other end projecting from the other end of that second spring in a neutral state where no torque is transmitted through the clutch disc.

4,518,072

CART CONVEYOR AND DISPENSER APPARATUS

James M. Muellner, 1777 Stillwater St., White Bear Lake, Minn. 55110, and Eugene R. Pastien, 8230 Longlake Rd., Moundsview, Minn. 55432

Filed Jun. 24, 1983, Ser. No. 507,810
Int. Cl.[3] G07F *1/06*
U.S. Cl. 194—4 D **40 Claims**



1. A conveyor for wheeled carts, the carts being of the type having a rotating member that is rotatably connected to the cart, said conveyor comprising:

(a) a continuous member having a periphery and a peripheral longitudinal axis lying therein;

(b) rotating means for operatively engaging said continuous member and rotating it about a plurality of drive axes, said drives axes being substantially parallel to each other; and

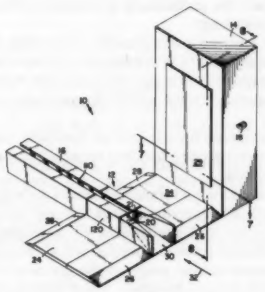
(c) means for releasably engaging the rotating member, said engaging means being operatively connected to said continuous member, wherein said conveyor is configured for propelling the cart in a direction substantially parallel to said continuous member's peripheral longitudinal axis, and wherein said continuous member periphery and said engaging means are configured to move relative to and beneath the cart's rotating member when the cart's motion is substantially impeded.

4,518,073

VEHICLE LOCK APPARATUS AND METHOD

Eugene R. Pastien, Moundsview, Minn., assignor to Smarte Carte, Inc., White Bear Lake, Minn.

Filed Jul. 8, 1983, Ser. No. 512,149
Int. Cl.[3] G07F *7/06*
U.S. Cl. 194—4 C **22 Claims**



1. A vehicle lock apparatus operable in response to a predetermined movement of a vehicle from a vehicle starting point to a vehicle intermediate point and finally to a vehicle ending point, the vehicle including a valid key having first and second characteristics, the valid first state to a second state in response to a corresponding predetermined movement of the valid key from a key starting point to a key intermediate point and finally to a key ending point, the valid key being operatively connected to the vehicle and configured to come into operative proximity with said lock apparatus during the predetermined movement of the vehicle and the valid key, said lock apparatus comprising:

(a) first means for detecting the valid key first characteristic, said first detecting means changing from a first state to a second state and back to said first state in response to movement of the valid key as the vehicle moves from the vehicle starting point to the vehicle intermediate point;

(b) second means for detecting the valid key second characteristic, said second detecting means changing between a first state and a second enabled state in response to movement of the valid key as the vehicle moves from the vehicle intermediate point to the vehicle ending point;

(c) means for enabling said second detecting means to change from its first state to its second enabled state, said enabling means being operatively connected to said first and second detecting means, wherein said enabling means prevents said second detecting means from changing from its first state to its second enabled state when said first detecting means is in its second state; and

(d) anti-reversing means operatively connected to said sec-

ond detecting means for preventing a key from passing from the key ending point to the key intermediate point, wherein said lock apparatus changes from its first state to its second state in response to said second detecting means changing from its second enabled state.

4,518,074

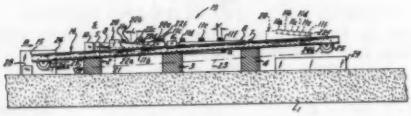
ARRANGEMENT AND A METHOD FOR TRANSFERRING PRODUCTS IN METAL PROCESSING INSTALLATIONS

Carl Langner, Monsey, N.Y.; Michael Poran, Washington Township, Bergen County, and Geza Szarka, Glen Rock, both of N.J., assignors to Concast Incorporated, Montvale, N.J.

Filed Apr. 21, 1983, Ser. No. 487,207

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—425 **53 Claims**



1. An arrangement for transferring products in metal processing installations, particularly for use in continuous casting apparatus, comprising:

(a) support means for temporarily supporting a plurality of articles at a plurality of predetermined locations spaced by a predetermined distance, said support means having a support surface for the articles located in a predetermined plane;

(b) transport means for the articles moveable between a first location and a second location to which the articles are to be transferred;

(c) guide means for said transport means defining a predetermined path which connects said first and second locations and traverses said predetermined locations, said guide means and said transport means being designed such that said transport means removes the articles from said support means along a direction which makes an acute angle with said predetermined plane to thereby reduce sliding movement of the articles on said support means, and said guide means and said transport means being further designed such that said transport means groups the articles during travel from said first to said second location so that the articles abut or are spaced by a distance smaller than said predetermined distance upon arrival at said second location; and

(d) drive means for moving said transport means along said predetermined path.

4,518,075

APPARATUS FOR GATHERING AND SINGULARIZING STACKS OF PAPER SHEETS OR THE LIKE

Kurt Aykut, and Klaus Reissmann, both of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

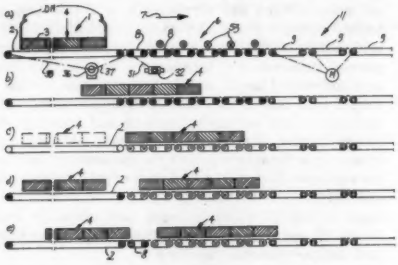
Filed May 5, 1982, Ser. No. 374,939

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118169

Int. Cl.³ B65G *47/31*

U.S. Cl. 198—460 **21 Claims**

1. Appparatus for manipulating groups of discrete commodities, particularly for singularizing groups of stacks of paper sheet or the like, comprising a first transporting unit arranged to receive a succession of groups consisting of at least substantially aligned neighboring commodities and to discontinuously advance such groups at a variable speed in a predetermined direction along a first portion of a predetermined path so that successive groups leaving said first unit are separated from each other by gaps, said first transporting unit comprising conveyor means for successive groups of commodities; a second transporting unit comprising a series of gathering conveyors defining a second portion of said path downstream of said first portion, as considered in said direction, first drive means for driving said conveyors at a constant first speed to thereby advance successive groups arriving from said first unit in said direction, second drive means for intermittently and individually driving at least certain of said conveyors at a higher second speed so as to eliminate the gaps between successive groups which are supplied by said first unit and to thus form a composite group of neighboring commodities, and means for



regulating the operation of said second drive means, said regulating means including means for accelerating said certain gathering conveyor to said second speed one after the other, as considered in said direction, said first transporting unit further comprising means for intermittently driving said conveyor means at speeds verying between zero speed and a speed exceeding said first speed; and a third transporting unit including singularizing conveyor means defining a third portion of said path downstream of said second portion and operative to convert said composite group into a row of spaced-apart equidistant commodities, and means for driving said singularizing conveyor means at a speed exceeding said first speed.

4,518,076

WORKPIECE PALLET TRAY WITH PLASTIC INSERT HOLDERS

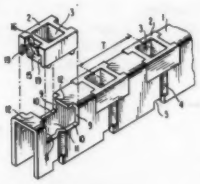
Armin Feisel, Schaffhausen, and Walter Wirz, Pfaffikon, both of Switzerland, assignors to Reishauer AG, Switzerland

Filed Aug. 5, 1981, Ser. No. 290,022

Claims priority, application Switzerland, Aug. 15, 1980, 6178/80

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—648 **8 Claims**



8. A pallet tray for transporting and storing workpieces, comprising; an elongated, metallic, base member (1) having upper and lower portions, a groove (7) provided in said lower portion and running in the longitudinal direction of the base member, said top portion including a plurality of openings, a plurality of plastic inserts (2) each having a holding pocket (3) configured to accommodate a particular workpiece, each said plastic insert being supported by and locked by cooperating locking means into each said opening receiving said insert, a bottom portion of each said plastic insert forming a low-fric-

tion upper boundary surface of said guide groove for engaging a guide rail.

4,518,077

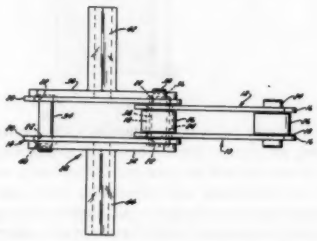
POLYMERIC SNAP-THROUGH ATTACHMENT FOR A HOLLOW RIVET CHAIN

Kenneth J. Ronco, Brookfield; Robert Sommer, Mequon; Ken Nigel; Donald Grimes, both of New Berlin; James A. Zirbes, Wauwatosa, and Robert E. Stacey, Waukesha, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Filed Aug. 23, 1982, Ser. No. 410,185

Int. Cl.³ B65G *19/24*

U.S. Cl. 198—731 **12 Claims**



1. A polymeric snap-on attachment for a hollow rivet chain, comprising:

first and second side members adapted to lie adjacent to the sidebars of the chain, at least one of said side members including an integral extension, and at least one of said side members including an integral pin-like projection adapted to fit through one of the hollow rivets in said chain; the other of said side members having a receptacle which receives said pin-like projection with a snap fit so as to fix said first and second side members to each other and to the chain, and an inwardly directed leg located on the lower portion of each side member and being adapted to be attached to each other underneath the chain.

4,518,078

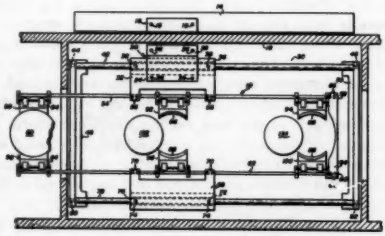
WAFER TRANSPORT SYSTEM

Charles B. Garrett, San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 381,022, May 24, 1982, abandoned. This application Jul. 24, 1984, Ser. No. 634,175

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—775 **9 Claims**



1. A wafer transport system comprising in combination:

transport means for carrying a member in translational motion;

a first magnet coupled to said transport means;

a second magnet mounted on a first plate, said first plate being connected to a fixed first guide rail by a bearing means permitting translational motion in a single plane;

a first transport rail adjacent and parallel to the first guide rail and rigidly connected to said first plate;

a second transport rail adjacent and parallel to the first transport rail and rigidly connected to the first transport rail fixing the first and second transport rails in the same plane as said first plate;

a second plate rigidly connected to the second transport rail;

a second fixed guide rail connected to said second plate by a bearing means to permit motion in a single plane;

a first, second, and third pair of wafer support arms with the first arm of a given pair pivotally mounted to the first transport rail and the second arm pivotally mounted to the second transport rail at a position directly opposite the first arm; and

a lifting means for taking a wafer off the wafer support arms and returning a wafer to the wafer support arms;

whereby movement of the first magnet causes movement of the second magnet thereby causing the first and second transport rails to move in the same direction and distance as the first magnet thereby positioning the wafer support arms in a desired position with respect to the lifting means.

4,518,079

BEND UNIT FOR A BELT CONVEYOR

Jürgen Paelke, An der Este 13, D-2117 Tostedt, Fed. Rep. of Germany

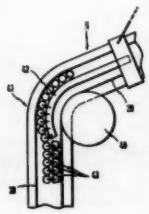
PCT No. PCT/EP82/00178, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. WO83/01057, PCT Pub. Date Mar. 31, 1983

PCT Filed Aug. 23, 1982, Ser. No. 506,643

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138192

Int. Cl.³ B65G *21/10*

U.S. Cl. 198—864 **6 Claims**



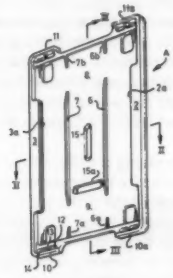
1. A bend unit for a bulk belt conveyor having a boom able to be luffed about a turning axis between upper and lower end positions of a boom luffing range, which at an outer free end thereof has an upright hanging leg joined with it, the conveyor further having in the boom and the leg a conveyor belt with carrying and return runs, of which the carrying run between the top end of the supporting leg and the free end of the boom is supported at the said bend unit by runners in the form of a curved rolling guide at the said free boom end, characterized in that the curved rolling guide made up of runners has a stiff part-circular guide and lower rocking jointed links at an upper end of said upright leg, the said jointed links keeping the runners in position and on luffing said boom into its top end position all the said links come to be supported one by one so as to take up a belt-supporting curved form as part of circle using supporting means.

4,518,080

CARD, ESPECIALLY ID-CARD INTENDED RETAINER

Kurt L. Ohlson, Harvägen 3B, 17800 Ekerö , Sweden

Filed Sep. 9, 1983, Ser. No. 530,665
Claims priority, application Sweden, Sep. 10, 1982, 8205146
Int. Cl.³ A45C *11/18*
U.S. Cl. 206—39 **6 Claims**



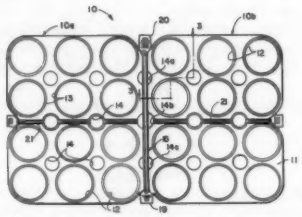
1. A retainer for a card, especially ID-card, provided with a bottom plate including opposite edges defining facing slots, said bottom plate and said opposite edges connected by bottom parts which guide opposite edge portions of the card when the card is inserted into said retainer, wherein two parallel ridges are provided on said bottom plate so as to give the card a curvature between said opposite edges; said ridges being discontinuous between opposite end portions of said plate positioned transversely to said opposite edges; said opposite end portions defining stop means for preventing movement of the card.

4,518,081

MULTI-UNIT TEAR-AWAY CONTAINER CARRIER

Pierre J. de Larosiere, 30 Duque de Palmela, 4C, 1200 Libson, Portugal

Filed Feb. 18, 1983, Ser. No. 467,965
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—158 **4 Claims**



1. A multi-unit tear-away container carrier, comprising:

a substantially flat sheet having a plurality of substantially uniformly distributed flanged openings therethrough for gripping and holding in spaced relationship the upper ends of a plurality of containers;

at least one tear strip formed in the sheet, defining sections of the carrier separable from one another, each section having at least one flanged opening therethrough for holding at least one container; and

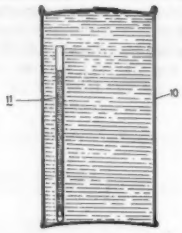
said carrier having a plurality of finger holes therein, disposed to enable any section of the carrier or the entire carrier to be lifted and carried by grasping appropriate pairs of finger holes, said tear strip extending around and forming a reinforcement to at least some of said finger holes.

4,518,082

DEVICE FOR TEMPORARILY ISOLATING AN ADDITIVE IN A BEVERAGE CONTAINER

Shem D. Ye, Yen Cheng District, Kaohsiung City, Taiwan

Filed Jan. 5, 1984, Ser. No. 568,362
Int. Cl.³ B65D *77/04*
U.S. Cl. 206—217 **2 Claims**



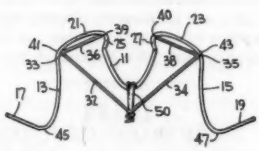
1. In a tight beverage container, a device for temporarily isolating an additive from a beverage comprising: a tube having a closed end and an open end for receiving an additive and a hole provided near said closed end; and a mass provided in said closed end so as to direct said closed end downward when said tube is suspended in the beverage container.

4,518,083

POULTRY TRUSSING DEVICE CARTRIDGE

Oscar C. Mayer, Jr., Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Nov. 21, 1983, Ser. No. 553,628
Int. Cl.³ B65D *83/00*
U.S. Cl. 206—340 **24 Claims**

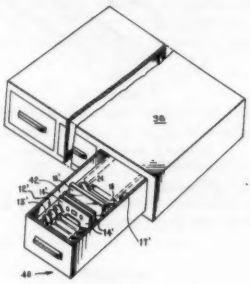


1. A cartridge for storing, in nested relationship, a plurality of poultry trussing wires of the type which comprise a length of resilient wire bent in plural longitudinal locations to define a generally V-shaped central segment of predetermined width with a pair of symmetrically disposed co-planar leg segments on opposite sides thereof, said central segment residing in a first plane which intersects at a first predetermined angle, a second plane defined by said leg segments, said cartridge comprising: an elongated member bent along first, second, and third parallel longitudinally-extending linear bends to define a first support rack having first, second, third and fourth rack sections, said first bend having a second predetermined angle and being disposed substantially centered with respect to said second and third bends between said first and second sections, said second bends being disposed between said first and third sections and having a third predetermined angle, said third bend being disposed between said second and fourth sections and having said third predetermined angle, wherein said first and second sections define a recess between said second and third bends, said recess being sufficiently large to receive the V-shaped central segment of multiple nested trussing wires positioned such that opposite leg segments of the trussing wires rest on said second and third bends, respectively.

4,518,084
STORAGE SYSTEM FOR EITHER BOXED OR UNBOXED CASSETTES

Joseph L. Berkman, Mamaroneck, N.Y., assignor to Berkman Industries, Inc., Boynton Beach, Fla.

Continuation-in-part of Ser. No. 429,200, Sep. 30, 1982, Pat. No. 4,432,453. This application Sep. 13, 1983, Ser. No. 531,779
Int. Cl.³ B65D *85/30, 85/62*
U.S. Cl. 206—387 **15 Claims**

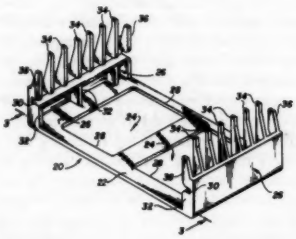


1. A storage unit or holder for magnetic tape cassettes and tape cassette boxes comprising at least one row having a plurality of tandem compartments for interchangeably receiving and storing either a boxed cassette or a pair of unboxed cassettes in the same compartment, each said compartment having opposite side walls connected by means of a bottom wall, and having twin parallel storage zones disposed transverse to said opposite side walls, each said compartment further comprising projection means separating and dividing said compartment into said twin parallel storage zones on either side of said projection means; at least one of said opposite side walls having vertical rib means disposed inwardly from said side walls for guiding and securely retaining a single boxed cassette in place in said compartment atop said projection means, and vertical end stop means for limiting transverse movement of unboxed cassettes stored securely retained between said projection means and said vertical rib means.

4,518,085
MULTI-PURPOSE TRANSPORT TRAY

William M. Chisholm, Midlothian, and Fred E. Thompson, Quinton, both of Va., assignors to AT&T Technologies, Inc., New York, N.Y.

Continuation of Ser. No. 373,191, Apr. 29, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,542
Int. Cl.³ B65D *1/38, 21/00*
U.S. Cl. 206—454 **4 Claims**

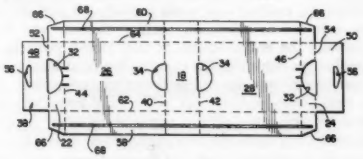


1. A multi-purpose, stackable transport tray comprising:
a base having edges, a first surface and a second surface;
two side portions having sides and extending from the first surface of the base at opposite edges of the base
a shelf running the length of each side portion projecting from the inside of each side portion toward the opposite side portion and located on the side of said side portion closest to the opposite side portion;
a plurality of first stiffening members extending from the shelf to the base and extending generally in a plane oriented substantially perpendicular to the side portions and the base;
a plurality of fin-shaped support members projecting from each side portion generally toward the other side portion and extending generally in a plane oriented substantially perpendicular to the side portions and the base, each support member spaced away from the shelf by an arbitrary amount, the shelves and said support members cooperating to define a plurality of compartments for supporting similarly-shaped articles in substantially parallel relationship;
a plurality of first ribs on the second surface of the base, extending in a direction parallel with the side portions, said ribs being positioned so as to interlock and engage the support members of an underlying tray;
a plurality of second ribs on the second surface of the base, extending perpendicular to the first ribs and so positioned to engage the support members of an underlying tray; and
the tops of the support members arranged to project adjacent the first and second ribs of a similar, overlying tray so as to prevent relative motion of the tray in either of two dimensions with respect to an overlying tray when an overlying tray is stacked on top of the tray, with or without articles within said compartments.

4,518,086
REINFORCED DISPLAY CARTON AND BLANK THEREFOR

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 16, 1984, Ser. No. 570,989
Int. Cl.³ B65D *75/02, 65/16*
U.S. Cl. 206—485 **2 Claims**



1. A display carton comprising:
(a) a pair of top display panels disposed in face-to-face contact and adhered together;
(b) a pair of upper panels connected to said top display panels along first fold lines, said upper panels depending from said top display panels;
(c) first openings formed in each of said upper panels closely adjacent to said first fold lines, said first openings being adapted to receive top edges of an article contained in said carton;
(d) a pair of side panels connected to said upper panels along second fold lines, said side panels depending from said upper panels;
(e) a bottom panel foldably connected to said side panels along third fold lines, said bottom panel connecting bottom edges of said side panels;
(f) second openings formed in each of said side panels closely adjacent to said third fold lines, said second openings being adapted to receive bottom edges of an article contained in said carton; and
(g) a reinforcing flap foldably connected to each end edge of said carton, each reinforcing flap extending continuous and uninterrupted from one of said first fold lines along

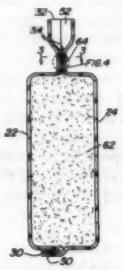
said upper panels, said side panels, and said bottom panel to the other of said first fold lines, and each of said reinforcing flaps being folded over its entirety into face-to-face contact with the inner surface of each of said upper, side and bottom panels and adhered thereto, said reinforcing flaps extending inwardly sufficiently to lie closely adjacent to and reinforce end edges of said first and second openings.

4,518,087

SEALED FLEXIBLE CONTAINER WITH NON-DESTRUCTIVE PEELABLE OPENING

Luigi Goglio, Milan, Italy, assignor to Fres-co System USA, Inc., Telford, Pa.

Filed May 20, 1983, Ser. No. 496,770
Int. Cl.³ B65D *33/16*
U.S. Cl. 206—632 **6 Claims**



1. A container comprising a flexible sheet material capable of being sealed for closing off the interior of the container from the ambient atmosphere, said sheet material being resistant to tearing, said container having an opposed pair of walls formed by said sheet material, each of said walls including an inner surface and an outer surface, said container comprising a mouth portion formed between said walls and of a predetermined length, each of said walls including a peel strip permanently adhered to the inner surface thereof and extending substantially the entire length of said mouth portion, each of said peel strips comprising a coextrusion of at least two plastic material layers permanently adhered to each other, said peel strips being disposed so that when said container is sealed portions of the same plastic material layer of each of said coextrusions are in releaseable engagement with each other to form an air-tight interfacial seal therebetween, said interfacial seal being readily openable by peeling said engaging portions of said peel strips from each other to provide a clean opening providing ready access to the interior of said container without tearing said sheet material.

4,518,088

MODULAR ASSEMBLY-TYPE STAND STRUCTURE PARTICULARLY FOR SUPPORTING STORAGE BATTERIES

Mario Passoni, Brugherio, Italy, assignor to Passoni Paolo & Figli S.r.l., Brugherio, Italy

Filed Sep. 17, 1982, Ser. No. 419,638
Claims priority, application Italy, Feb. 5, 1982, 19484 A/82
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—13 **5 Claims**

1. A modular assembly-type stand structure particularly for supporting storage batteries, comprising:

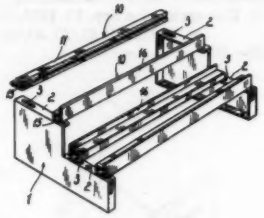
step-like shaped supporting side plates, defining at least two shelf planes;

top edges of said side plates, whose surfaces extend substantially perpendicular to said side plates;

longitudinal stringers extending in lengthwise direction arranged for mutual engagement at said top edges;

through openings, having an elongated configuration in said top edges for widthwise adjustment of the mutual distance between a pair of said longitudinal stringers;

a slot at the lower face of said longitudinal stringers adapted to engage with said top edges for lengthwise adjustment



of the mutual distance between a pair of said supporting side plates; and

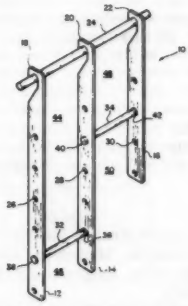
removable mounting means connecting said longitudinal stringers to said side plates.

4,518,089

AUXILIARY CLOSET SYSTEM

Frank P. Campbell, 13463 W. 78th Pl., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 318,046, Nov. 4, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,102
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—118 **13 Claims**



1. An auxiliary closet rod assembly adapted to be mounted on and supported solely by a main horizontally extending closet rod device fixedly supported by permanently mounted closet structure, comprising:

at least two rigid elongated hanger bar means, each having spaced opposite side surfaces and a hanger opening at an upper end thereof for pivotal engagement with the main closet rod device and for supporting said hanger bar means in vertically downwardly extending relationship to the main closet rod device and having at least one rod support opening defined by an annular surface in an intermediate portion thereof for receiving and supporting an auxiliary rod means, the hanger opening and the support opening of each hanger bar means being spaced apart equal distances so as to be vertically alignable;

at least one rigid auxiliary rod means having opposite end portions slidably mountable in and extending through said support openings in adjacent ones of said hanger bar means and extending horizontally therebetween beneath the main closet rod for hanging garments thereon;

retaining means being mountable on said opposite end portions of said rigid auxiliary rod means and operably associated with said hanger bar means circumjacent said support

openings for limiting longitudinal movement of said auxiliary rod means relative to said hanger bar means; said retaining means comprising:

at least one cup shape member being made of one piece of resilient flexible molded plastic material and having a central opening for slidably frictionally telescopically receiving the end portion of said auxiliary rod member and an outer wall surface for slidably frictionally engaging the surface of said support opening; and

releasable locking means associated with said cup-shape member for frictionally releasably locking said cup-shape member and the end portion of said auxiliary rod member in said support opening in said hanger bar member.

4,518,090

BOOMS FOR CRANES AND THE LIKE

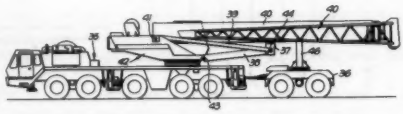
William R. Thomasson, County Durham, England, assignor to Coles Cranes Limited, Sunderland, England

Filed Aug. 18, 1982, Ser. No. 409,222

Claims priority, application United Kingdom, Aug. 18, 1981, 8125175

Int. Cl.³ B66C *23/36*

U.S. Cl. 212—189 **11 Claims**



1. A lifting apparatus comprising:

a platform;

a boom having head and foot ends and being pivotally mounted to the platform at its foot end at a first pivot point on the platform;

a cradle sized to slidably support the boom;

an extendible ram pivotally mounted to the platform at its one ram end at a second pivot point on the platform and to the cradle at its other ram end at a third pivot point on the cradle;

a tension link having first and second link ends and being pivotally mounted to the platform at said first link end at a fourth pivot point on the platform and to said cradle at said second link end at a fifth pivot point on the cradle, said first and fourth pivot points being generally coincident; and

a holdfast member fastened to said cradle, said cradle and holdfast member arranged and adapted to loosely surround said boom so to keep said boom from bouncing in said cradle.

4,518,091

MOTOR VEHICLE FUEL TANK

Dieter Scheurenbrand, Ostfildern; Manfred Stotz, Aichwald; Manfred Distel, Ostfildern, and Einhard Kleinschmit, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 215,844, Dec. 12, 1980, abandoned.

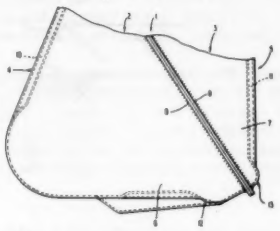
This application Apr. 11, 1983, Ser. No. 483,594

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949900

Int. Cl.³ B65D *6/32, 6/38*

U.S. Cl. 220—5 A **11 Claims**

1. A composite fuel tank for motor vehicles, comprising two shaped shells each having a shell bottom adjoined by shell walls, each of said two shaped shells being provided with circumferential shell rim means along which the two shells are welded together, said welded together shell rim means forming a seam extending upwardly from a bottom area to a top area of the composite fuel tank, said seam including a portion extending generally parallel to and spaced from the bottom area of the composite tank, each said shell bottom forming one of two side walls in an installed composite fuel tank, at least one shell bottom having reinforcing means extending and tapering generally toward the bottom of the fuel tank, one of the shell walls forming at least part of a bottom wall of the composite fuel tank and extending substantially transversely to the reinforcing means, channel-like outwardly extending bulge means extending generally transversely to said reinforcing means for forming a deformation zone, said bulge means being associated with ends of the reinforcing means and disposed proximate and generally parallel to the portion of the seam extending substantially parallel to the bottom area of the composite tank, wherein stresses in said tank due to fuel contained therein and transmitted to said deformation zone, will be absorbed thereby.



4,518,092

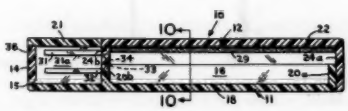
MOLDED CONTAINER WITH LIVING HINGES

Joseph P. Contreras, Sr., Brockden Dr., Mendam, N.J. 07945

Filed Jan. 18, 1984, Ser. No. 571,787

Int. Cl.³ B65D *39/00*

U.S. Cl. 220—20.5 **7 Claims**



1. An integrally injection molded container formed of synthetic thermoplastic material comprising,

a. base member means defining a storage compartment, and an enclosed side compartment disposed in general alignment with the storage compartment,

b. said means defining the enclosed side compartment open at each respective opposite end thereof, and one of said open ends disposed in communication with the storage compartment,

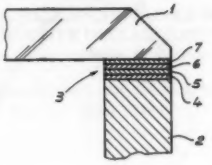
c. a first closure member connected by a living hinge to the base member means on the section thereof defining the storage compartment movable from an open position to a closed position for sealing the storage compartment, and

d. said first closure member having a detachable latch means for holding the first closure means in the closed position,

e. a second closure means connected by a living hinge to said base member means and disposed for closing and generally sealing the open end of said enclosed side compartment remote from the end in communication with the storage compartment, and

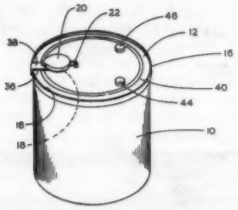
f. said second closure member having a latch means for generally locking the second closure member in the closed position.

4,518,093
WATCH CASE
Paul Gogniat, Chemin de la Prévote 14, 2504 Bienne, and Eric Loth, Tiefenmattweg 40, 2500 Bienne, both of Switzerland
Filed May 15, 1984, Ser. No. 610,418
Claims priority, application Switzerland, May 19, 1983, 2743/83
Int. Cl.³ G04B *37/00*
U.S. Cl. 220—82 R **4 Claims**



1. A watch case which comprises a metal part and a glass soldered to the metal part, said glass having a metal coating thereon over the area thereof soldered to the metal part, said coating including an outer layer of a material similar to that of the metal part.

4,518,094
REMOVABLE LID AND POUR SPOUT
Ronald W. Kodman, 467 N. Van Ave., Fresno, Calif. 93710
Filed Jul. 21, 1981, Ser. No. 285,598
Int. Cl.³ B65D *51/18*
U.S. Cl. 220—254 **2 Claims**



1. A removable closure member for use in closing the opening of a cylindrical container, said member being comprised of a plastic pliable material, said container including a peripheral ridge with an annular tubular shaped receiving groove for receiving the closure member, said groove having an annular opening being reduced in size in relation to the size of the tubular shaped groove, said removable closure member including:

a substantially flat discal shaped portion having an outer peripheral edge, said portion having a circumferential size approximately equal to the circumferential size of said container and adapted to be placed over said container;

an opening in said discal shaped portion being disposed the peripheral edge of said discal shaped portion;

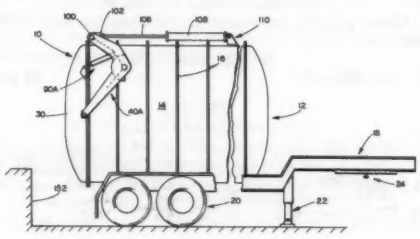
a downwardly extending sealing skirt disposed around the outer peripheral edge of said discal shaped portion adapted to be inserted into the opening in said tubular receiving groove of the container;

an inner annular lip disposed on the inner side of said downwardly extending skirt defining an annular groove between said lip and the under portion of said flat discal portion to effect sealing of said skirt in said receiving groove in said cylindrical container;

a beveled portion on said inner side of said skirt below said lip to reduce the size of said skirt to accommodate entrance of said skirt into the reduced opening in the groove in the container; and

means disposed in said substantially flat discal shaped portion for causing the overall diameter of said member to increase in size when stretched on a container of enlarged diameter, said means including an annular channel formed in said flat discal shaped portion and spaced inwardly from the outer peripheral edge of said discal shaped portion.

4,518,095
DOOR ASSEMBLY
Gerald H. Engwert, Toledo, Ohio, assignor to Fresh Tech, Inc., Grand Rapids, Ohio
Filed Jun. 1, 1984, Ser. No. 616,130
Int. Cl.³ B65D *43/14*
U.S. Cl. 220—260 **19 Claims**



15. A door assembly for providing access to a chamber comprising, in combination, a chamber having sidewalls, a door, a pair of crank arms, each of said crank arms having a centrally disposed pivot, a first end spaced from said pivot and a second end spaced from said pivot, said first pair of ends pivotally secured to said door along a first axis, bearing means secured to said sidewalls of said chamber for supporting said pair of crank arms at said centrally disposed pivots for motion about a second axis parallel to said first axis, said bearing means including pairs of opposed bearing plates disposed normal to said second axis means extending along a third axis parallel to said first axis for coupling said second pairs of ends, means coupled to said just recited means for moving said pair of crank arms about said second axis and a pair of links pivotally secured to said door at points along a fourth axis parallel to said first axis and extending to a fifth axis adjacent and parallel to said second axis.

4,518,096
DRINK-THROUGH CONTAINER LID WITH REMOVABLE DRINK-THROUGH SECTION
Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.
Filed May 12, 1983, Ser. No. 494,048
Int. Cl.³ B65D *41/46, 41/48*
U.S. Cl. 220—268 **4 Claims**

1. A flexible plastic lid means for open-mouthed containers having a peripheral bead or rim defining the open mouth thereof, comprising:

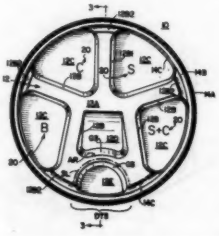
a rim receiving peripheral bead cavity means formed in the outer periphery of said lid for engaging the peripheral bead of a said container and retaining said lid means thereon;

central web means bounded by said bead cavity means for overlying the open mouth of a said container and having a raised area defined therein; and

finite score line means including a score line formed in said raised area and oriented therein to subtend a given peripheral portion of said bead cavity means, the configuration of said score line means substantially defining the bound-

aries of a tear-away drink-through section in said lid means extending inboard of said bead cavity means;

said score line means including gripping means defined by surfaces disposed on opposite sides of said score line and forming at least a part of said raised area and also being disposed in spaced-apart relationship with said rim and radially inwardly of said rim for applying a squeezing force transversely of said score line at a location remote from said rim, said score line means being responsive to said squeezing force so applied to fracture said score line and render said tear-away drink-through section removable from said lid means by way of predictable fracture of said score line in response to a pulling force subsequently applied to said gripping surfaces adjoining said drink-through section;



first and second depressed cavity means defined in said raised area and mutually bounded over a portion of said finite score line means to define said gripping surfaces; and

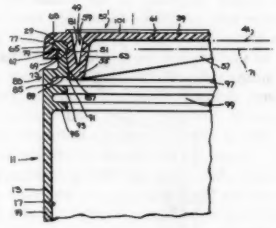
wherein said gripping means comprises upstanding first and second surface means defined in said first and second depressed cavity means, respectively, on opposite sides of said score line in the provision of a ridged shape to that portion of said score line means.

4,518,097

PLASTIC CONTAINER AND CLOSURE

James W. Milton, Short Hills, and Robert W. Boig, Monroe Township, Middlesex County, both of N.J., assignors to Van Dorn Co., Elizabeth, N.J.

Filed May 24, 1984, Ser. No. 613,613
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—307 **20 Claims**



1. A plastic container comprising:

a container body having a cylindrical wall with a longitudinal axis of symmetry, said cylindrical wall having at one end a circular rim defining a container mouth, said container body having a planar wall at an end of said cylindrical wall opposite said rim and said mouth, said cylindrical wall having an inner side and an outer side;

a substantially planar container lid having a circular periphery with closure means engageable with said rim in a snap-lock fit for closing said container; and

detent means for locking said lid to said container body upon the engagement of said closure means with said rim during a closing operation, said detent means including:

(a) at least one first shoulder surface on said outer side of said cylindrical wall in a region about said rim and a first lip on said lid conformingly engaging said first shoulder surface in a closed state of said container;

(b) at least one second shoulder surface disposed on said inner side of said cylindrical wall in a region about said rim and a second lip on said lid conformingly engaging said second shoulder surface in a closed state of said container, said second shoulder surface facing inwardly into said body substantially towards the closed end thereof; and

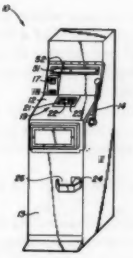
(c) at least one third shoulder surface disposed on said inner side of said cylindrical wall between said rim and said second shoulder surface and a third lip on said lid conformingly engaging said third shoulder surface in a closed state of said container, said third shoulder surface facing inwardly into said body substantially towards the closed end thereof.

4,518,098

COMBINATION VENDING AND SLOT MACHINE

Lane G. Fleischer, 795 Manzanita La., Reno, Nev. 89509

Filed Nov. 4, 1982, Ser. No. 439,268
Int. Cl.³ G07F *17/34*
U.S. Cl. 221—15 **6 Claims**



1. A vending machine in the style of a slot machine and having at least in part a slot machine function, comprising:

a housing;

a slot machine mechanism mounted inside the housing, including a plurality of symbol reels, with a window in the front of the housing through which the symbol reels are visible;

a swingable slot machine actuator handle on the exterior of the housing, operably connected to the slot machine mechanism such that pulling of the actuator handle is effective to actuate the slot machine mechanism, rotating the symbol reels in the manner of a slot machine;

means associated with the slot machine mechanism for successively stopping the rotation of the reels;

a hopper at an upper location in the housing for articles to be vended, an article dispensing outlet at a lower location on the housing, a coin insert slot and a coin drop area in the housing; and

vending means in the housing for dispensing an article from the hopper to the dispensing outlet in response to insertion of a coin, including timing means for causing the article to reach the outlet within a predetermined time interval after the coin is inserted, the vending means comprising a vending wheel mounted at the bottom of the hopper for rotation about a vertical axis and having a plurality of openings equally angularly spaced on the wheel for passing one article from the hopper at a time, a chute positioned just below the vending wheel such that a partial rotation of the wheel will bring a single article over the chute, permitting it to drop, with means for blocking further articles from

dropping, a motor for rotating the vending wheel, and means for activating the motor in response to the insertion of a coin;

said predetermined time interval being longer than the time ordinarily required for a user to pull the handle and for all the symbol reels in the slot machine mechanism to stop.

4,518,099

PORTABLE TOOTHPICK CASE

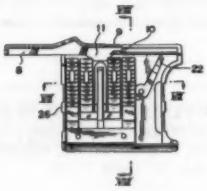
Takao Makishima, Suita; Shigeru Inaba, Kawachinagano, and Yasuyoshi Wada, Osaka, all of Japan, assignors to Sunstar Kabushiki Kaisha, Takatsuki, Japan

Filed Sep. 7, 1983, Ser. No. 530,098

Claims priority, application Japan, Sep. 9, 1982, 57-137265[U]

Int. Cl.³ A47G *21/12*

U.S. Cl. 221—30 **4 Claims**



1. A portable toothpick case which comprises

a flat box-like body composed of a flat base member and a flat cover member and having elongate top and bottom openings lengthwisely extended on its top and bottom periphery walls, respectively;

a lid member lengthwisely slidably mounted on the top opening of the body and having a concave cross-section and a means for taking out toothpicks contained in the body;

a toothpick delivery means held on the inside wall of the base member;

a movable bottom plate mounted on the bottom opening to open and close the bottom opening; and

a fixing means for integrally fixing the base and cover members,

said means for taking out toothpicks being composed of an opening for taking out a toothpick provided on the outer surface of one lengthwise end of the lid member, a guide plate provided inside of the lid member below the opening, and a projection projected toward the inside of the body from the side wall of the lid member adjacent to the inner surface of the flat side wall of the base member;

said delivery means being composed of a stopper member, a moving member, a supporting member and a "modified V-shaped" lever provided on the inner surface of the flat side wall of the base member, said stopper member being an elastic deformable elongate strip longitudinally extended from the bottom of the base member with spacing from the inner surface of the inside wall of the base member one end of which is fixed to the bottom of the base member, said moving member being an longitudinally extended elastic deformable elongate strip similar to the stopper member, said supporting member being incorporated with the moving member and longitudinally movably supporting the moving member, and said lever being pivoted at its middle part to the inner surface of the base member and one free end thereof being engaged with the supporting member

said stopper member and said moving member having at least one nail on their surface facing to the cover member, respectively;

said lever having such a length of arm and an angle of the "modified V-shape" that the other free end is pushed down by the projection when the lid member is closed by sliding; and

said supporting member having such a length that it comes into contact with the projection of the lid member to be pushed down when the lid member is opened by sliding.

4,518,100

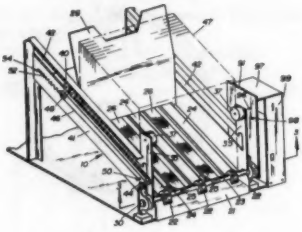
NEWSPAPER DISPENSING MACHINE

George E. Martin, 14131 - 76th Ave., Surrey, British Columbia, Canada

Filed Dec. 20, 1982, Ser. No. 450,993

Int. Cl.³ B65H *3/24*

U.S. Cl. 221—225 **20 Claims**



1. A newspaper dispensing machine comprising:

(a) a frame;

(b) slide means mounted on said frame for supporting a vertically orientated stack of newspapers whose folded edges face downwardly, said slide means having a discharge end;

(c) pressure plate means mounted on said frame for biasing the vertically orientated stack of newspapers towards the discharge end of said slide means;

(d) a discharge chute located proximate the discharge end of said slide means;

(e) transporting means mounted on said frame proximate the discharge end of said slide means having lip means for engaging a folded edge of a leading newspaper in the stack of newspapers at the discharge end of said slide means;

(f) friction belt means mounted on said frame having an upper newspaper contacting surface with a high coefficient of friction with paper and reversibly movable from a retracted position spaced apart from the folded edges of the stack of newspapers to an extended position abutting the folded edges of the newspapers and slightly upwardly and rearwardly of the retracted position;

(g) moving means mounted on said frame and coupled to said friction belt means for reversibly moving the latter from the retracted position to the extended position and coupled to said transporting means such that said transporting means raises the leading newspaper above a notional plane defined by folded edges of the remaining newspapers in the stack, then said friction belt means moves from the retracted position to the extended position raising the remaining newspapers in the stack and moving them away slightly from the leading newspaper to relieve pressure on the leading newspaper and then said moving means moves the leading newspaper to and discharges it into said discharge chute.

4,518,101

METERING SYSTEM FOR CORROSIVE LIQUIDS AND METHOD THEREFOR

Philip R. Robinson, New Kensington, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1983, Ser. No. 478,575

Int. Cl.³ B67D *5/30*

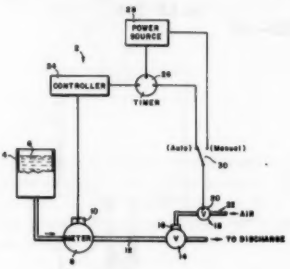
U.S. Cl. 222—1 **9 Claims**

1. A metering system for automatically controlling and monitoring corrosive liquids, the system comprising:

conduit means through which the corrosive liquid flows from a reservoir to a discharge location;

valve means in said conduit means for commencing and stopping the flow of corrosive liquids through the conduit means, said valve means being corrosion resistant and having an actuator for opening and closing the valve;

means for metering the flow of corrosive liquids upstream of the valve means, said metering means being corrosion resistant, being maintained full of the corrosive liquid and having a transmitting device for transmitting an electrical signal proportional to the flow;



means for controlling the flow of corrosive liquids, said means electrically connected to said metering means and having a receiving device for receiving the electrical signal of said metering means and counting volume units of flow through the metering means, and said means capable of transmitting an electrical signal to stop flow through the valve at a predetermined volume;

means for activating the system at a preset time, said means electrically connected from a power supply to the controlling means; and

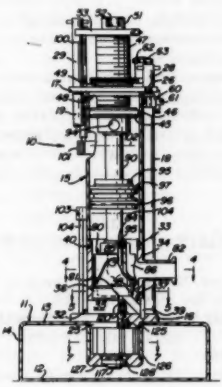
means for actuating the valve means, said actuating means being electrically connected to the timing means.

4,518,102

METERING DEVICE FOR FLUIDS

Dale Tanner, P.O. Box 54, Rte. 47, Hurffville, Sewell, N.J. 08080

Filed Feb. 17, 1983, Ser. No. 467,203
Int. Cl.³ G01F *11/44*
U.S. Cl. 222—61 **8 Claims**



1. A metering device comprising a mounting structure, a cylinder mounted by said mounting structure, and closures closing opposite ends of said cylinder, a piston in said cylinder shiftable between said end closures, a conduit in said cylinder extending in fluid communication between said enclosures, angularly spaced inlet and outlet connections opening into one end closure, a valve plug angularly shiftable in said cylinder adjacent to said one end closure, said valve plug having angularly spaced passageways communicating said connections with respective sides of said piston and upon plug shifting communicating said connections with other sides of said piston, and gasket means extending in sealing relation about said plug and on opposite sides of said passageways to seal the latter from each other, said passageways being generally coplanar, and said gasket means extending generally sinusoidally an even number of cycles about the circumference of said valve plug onto opposite sides of said passageways, to effect said sealing while balancing forces between said plug and cylinder and self centering of said plug in said cylinder.

4,518,103

METHOD AND APPARATUS FOR RELEASING ADDITIONAL INGREDIENTS IN A PRESSURIZED CONTAINER

Walter K. Lim, Aerosol Services Co., 425 S. Ninth St., City of Industry, Calif. 91746, and Arthur A. Krause, 7035 Lanewood Ave., Hollywood, Calif. 90028

Filed Sep. 9, 1981, Ser. No. 300,506
Int. Cl.³ B65D *83/00*
U.S. Cl. 222—135 **18 Claims**

1. A dispensing container comprising:

a primary container pressurized by an initial supply of propellant including a first liquified propellant and a gaseous propellant and containing a first substance to be expelled therefrom under pressure;

valve means communicating only with said primary container for dispensing the contents of said primary container; and

a secondary container within said primary container closed against said gaseous propellant and pressurized by a reserve supply of liquified propellant having a characteristic head pressure higher than said first liquified propellant, and containing a second substance to be added to said first substance, said secondary container being constructed to open and release said second substance into said primary container only upon establishment of a predetermined pressure differential between the interior of said primary container and the interior of said secondary container by discharge of said gaseous propellant from said primary container through said valve means.

4,518,104

WINE DISPENSING APPARATUS AND METHOD

Frank M. Iannelli, Spartanburg, and David H. James, Roebuck, both of S.C., assignors to Gerlach Industries, Spartanburg, S.C.

Filed Jan. 14, 1983, Ser. No. 458,163
Int. Cl.³ B67D *5/62*
U.S. Cl. 222—146.6 **2 Claims**

1. Apparatus for dispensing large numbers of wine servings at a uniform wine serving temperature during varying cycles

of time such as in restaurant operations and the like comprising:

a cabinet having an interior chamber for storing a source of wine at room temperature;

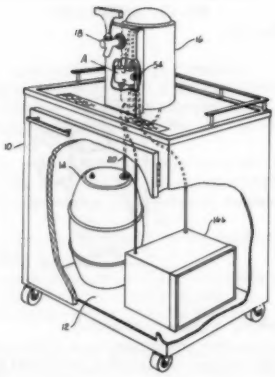
a refrigeration unit carried by said cabinet through which said wine is delivered for refrigerating and lowering the temperature of said wine;

a wine dispensing valve carried by said cabinet for dispensing wine into a serving container when said valve is open;

a first wine delivery line for conveying said wine from said source to said refrigeration unit;

a second wine delivery line for conveying wine from said refrigeration unit to said dispensing valve;

a wine mixing valve carried in said cabinet having a first passage serially connected in said first delivery line between said wine source and said refrigeration unit and a second passage serially connected in said second delivery line between said refrigeration unit and dispensing valve;



said wine mixing valve including a third valve passage connected between said first and second passages for delivering a metered amount of wine from said first passage to said second passage bypassing said refrigeration unit;

valve means carried in said third valve passage for controlling and metering the amount of wine bypassed through said third passage;

a conical entrance port provided in said third valve passage, said conical entrance port tapering outwardly and opening into said first passage for creating a venturi effect for drawing room temperature wine through said third passage in response to opening of said wine dispensing valve and flow of refrigerated wine through said second valve passage, and

said valve means including a manually operable valve stem threadably carried by said wine mixing valve having a tapered valve member corresponding to the taper of said entrance port for closing and opening said entrance port in varying amount.

4,518,105

METHOD OF AND DEVICE FOR DISPENSING VISCOUS CONCENTRATES OF VARIABLE VISCOSITY IN ACCURATELY METERED QUANTITIES OF VARIABLE VOLUME

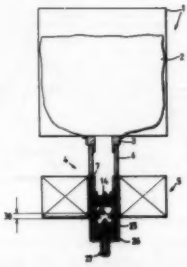
Alexander Kuckens, Reinfeld, and Horst Kohl, Bad Oldesloe, both of Fed. Rep. of Germany, assignors to DAGMA Deutsche Automaten-und Getrankemaschinen GmbH & Co., Ltd., Reinfeld, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,899

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3112024

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—207 **9 Claims**



1. An improved device for dispensing a viscous concentrate of variable viscosity of the type in which a dispensing section is adapted to be connected to a container for the concentrate and to be inserted into an annular actuating means having an actuating element which axially acts on a section of flexible elastic material forming a pumping volume, to cyclically reduce and expand the volume, the pumping volume containing a non-return valve with a rigid valve body at least at an inlet side and an outlet on another opposite outlet side, wherein the improvement comprises:

the section forming the pumping volume comprises a hollow cylindrical body arranged in the dispensing section insertable into the actuating means and is small as compared to the respective quantities to be dispensed;

a radially shape-retaining hollow cylindrical member adapted, at least during the volume reducing phase, to radially outwardly support the hollow cylindrical body against deformation;

biasing means by which the hollow cylindrical body in the initial position of the maximum pumping volume is biased with a predetermined force in the sense of increasing said pumping volume; and

the hollow cylindrical body has at least one radially inwardly pointing annular fold and wherein the hollow cylindrical member radially supporting the hollow cylindrical body is formed by two rigid sleeve portions, one of which being movable as a unit with the actuating element in axial direction relative to the other one.

4,518,106

COLLAPSIBLE BAG AND DISCHARGE VALVE THEREFOR

Arthur E. LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.

Filed May 21, 1984, Ser. No. 612,456

Int. Cl.³ B65D *88/26*

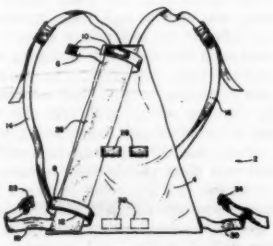
U.S. Cl. 222—460 **15 Claims**

1. In combination a bag having a bottom wall provided with a discharge opening located generally at the central portion thereof, a flexible tubular discharge spout extending downwardly from said opening, said discharge spout being collapsible to close said opening and extendable to open the discharge opening, support means on the bag spaced around said dis-

charge spout, a discharge valve casing and means detachably suspending said casing from said support means in a position aligned with and spaced below said discharge opening, said spout, when extended from the collapsed condition, extending

downwardly into said valve casing and a valve member on said casing located below the lower end of the extended spout so that it is operable both to permit and to arrest flow of the contents of the bag downwardly therethrough while the spout is in said extended position.

4,518,107
CARRIER SYSTEM FOR SKI EQUIPMENT
Jacquelyn V. Amos, Vail, Colo., assignor to Ski Pack International, Inc., Boca Raton, Fla.
Filed Jun. 22, 1983, Ser. No. 506,524
Int. Cl.³ A45F *3/04*
U.S. Cl. 224—215 **10 Claims**



1. A carrier system for elongated ski equipment designed to permit a user to carry said carrier system and any elongated ski equipment held thereto on the back between the shoulders, while leaving the arms and hands free, said system being convertible from a carrier to a waist belt and vice versa, comprising, in combination:

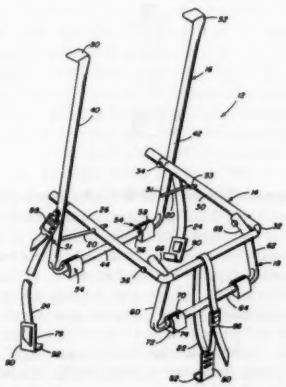
a flexible, substantially trapezoidal body member having a first substantially flat side, a first side edge, a second side edge, and a bottom edge, wherein at least one of said side edges is at an angle oblique to the body of a user when said carrier system is carried on a user's back between the shoulders, and an opposed second side, said first side being adapted to rest against a user's back substantially between the shoulders;

at least two spaced apart holding straps, each holding strap including, in combination, a releasable closure system wherein the two most widely spaced apart straps define a substantially straight path between them, said holding straps located and adapted to releasably hold elongated equipment on said second side of said body member, and wherein said straight path defined by said holding straps is substantially parallel to said oblique edge, and wherein there is a reinforcing strip secured to said second side of said body member along a substantial portion of said straight path defined by said most widely spaced apart holding straps;

a pair of adjustable harness straps attached to said body member so as to enable said body member to be carried on the back over both shoulders of a user; and an adjustable belt system connected to said body member and adapted to be secured around the waist of a user by releasable closure means in combination with said belt system, said belt system including a first portion and a second portion, said first belt portion extending from said first side edge of said body member, and said second belt portion extending from said second side edge of said body member;

whereby, a user is permitted to carry the carrier system and any elongated ski equipment held thereto by said holding straps on the back, between the shoulders, and, with said belt system, limit movement of said carrier system and any elongated ski equipment held thereto when said system is being used as a carrier, said belt system being further adapted, when said body member is converted to a smaller folded structure, to provide a waist belt by which said folded structure may be secured around the waist of a user, both modes leaving the arms and hands of the user free.

4,518,108
FOLDING CARRIER
Richard A. Allen, Bowles Ter., Lincoln, Mass. 01773
Filed Jan. 3, 1984, Ser. No. 567,579
Int. Cl.³ B60R *9/10*
U.S. Cl. 224—314 **12 Claims**



1. A folding carrier mountable on an automobile or the like, said carrier comprising:

(a) a frame;

(b) a carrying member pivotally mounted to said frame said carrying member movable about a first axis between an operative extended position and a collapsed position, said carrying member and said frame being in a substantially side-by-side relationship when said carrying member is in its collapsed position, a foot of said carrying member positioned to contat the automobile when said carrying member is in its operative extended position;

(c) bracing means mounted to said frame and configured to engage and disengage said carrying member, said carrying member fixed in its extended position when said bracing means is in engagement with said carrying member; and

(d) a supporting member pivotally mounted to said frame and constrained for limited rotational movement relative thereto between an extended position and a collapsed position about a second axis, said first axis being parallel to said second axis, when said supporting member is in its extended position, a portion of said supporting member is

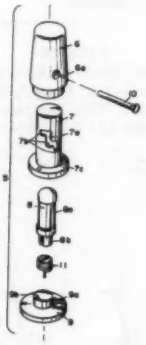
pressed against said frame and said supporting member is prevented from further movement relative to said frame, said supporting member and said frame being in a substantially perpendicular relationship to one another when said supporting member is in its extended position, said supporting member and said frame being in a substantially side-by-side relationship when said carrying member is in its collapsed position, a foot portion of said supporting member positioned to contact the automobile when said supporting member is in its operative extended position.

4,518,109

MAGAZINE DEVICE OF AIR NAILER

Tadayoshi Shiroyama, Honmachi Uenoshi, Japan, assignor to Tachikawa Pin Seisakujo Co., Ltd., Japan

Filed Jun. 27, 1983, Ser. No. 508,014
Claims priority, application Japan, Feb. 2, 1983, 58-14270[U]
Int. Cl.³ B25C *5/02, 5/06, 1/04*
U.S. Cl. 227—109 **1 Claim**



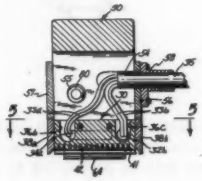
1. A magazine device of an air nailer characterized in that a magazine cover is fitted to a magazine case fixed to the body of the air nailer and capable of storing a coil nail in such a manner that said magazine cover can open and close a loading port for said coil nail; a support shaft is formed by fitting sequentially and concentrically a guide post having an outer diameter corresponding to a winding diameter of said coil nail, an adjust post inside said guide post and a tension post inside said adjust post to the center of the bottom of said magazine cover and integrally fixing a dish-like nail bracket for receiving the tips of nails of said coil nail to the lower end surface of said guide post with said guide post being at the center of said nail bracket; a guide pin is inserted through said support shaft in the radial direction with the right and left ends of said pin being fixed to said guide post; the lower end of said adjust post is fixed to the bottom of said magazine cover; guide window holes for said guide pin and receiving stages having sequentially varying heights are step-wise defined around the outer circumference of said adjust post so as to engage with said guide pin; said guide post, guided by said guide pin, can extend or contract whole being rotated outside said adjust pin; a guide for said guide pin is defined in the intermediate portion on the outer circumference of said tension post and passes through said tension post in radial direction, to extend over a predetermined length in the axial direction of said tension post and to allow the movement of said guide post guided by said guide pin in the axial direction of said support shaft; said tension post is supported by a tension spring interposed between the lower end surface of said tension post and the bottom of said magazine cover; and the upper and lower ends of said tension spring are wound and fixed to the bottom of said magazine cover and to said tension post so that said guide pin receiving the rewinding force of said tension spring always engages resiliently with said receiving stage of said guide window hole.

4,518,110

DEVICE FOR SOLDERING/DESOLDERING APERTURED LENDLESS PACKAGES

Carl D. Breske, Scandia, and Jeffrey M. Borning, Ham Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 22, 1982, Ser. No. 421,604
Int. Cl.³ B23K *3/02*
U.S. Cl. 228—20 **5 Claims**



1. A tool for soldering and for desoldering a chip to a circuit board; said chip having an array of sockets extended through it from a bottom surface to a top surface thereof, and said circuit board including at least one array of pins mounted to said board and extended away therefrom, whereby the end of each pin remote from said circuit board extends into one of said sockets whenever said chip is positioned for soldering to said circuit board; said tool comprising:

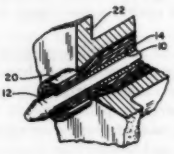
a heater member comprised of a flat heating plate heated by at least one heating element; means defining a plurality of pin relief apertures in said plate; means for removably mounting said chip to said heater member in a secured position wherein the top surface of said chip abuts said plate and each of said sockets is aligned with one of said pin relief apertures, whereby said apertures receive any of said pins extending through their associated sockets and beyond said top surface with said chip in said secured position and so positioned for soldering; and means defining a suction chamber disposed within said heater member adjacent said plate and in fluid communication with a suction means; said pin relief apertures providing fluid communication between said suction chamber and said chip, whereby as said heating plate melts solder joints to produce melted solder, said melted solder is drawn through said pin relief apertures into said suction chamber.

4,518,111

METHOD OF FABRICATING A BI-METAL TUBE

Roy Hardwick, Louisville, Colo., assignor to Explosive Fabricators, Inc., Louisville, Colo.

Filed Oct. 17, 1983, Ser. No. 542,532
Int. Cl.³ B23K *20/08*
U.S. Cl. 228—107 **10 Claims**



1. A method of forming a composite billet from dissimilar metals, said method comprising:

placing a first tube of a first metal within a second, larger tube in parallel spaced relation, the larger tube being made of a second metal which is dissimilar from the first metal;

explosively bonding the first and second tubes to form a composite tube;

placing the composite tube in a third tube; and

co-extruding the third tube and the composite tube to form a metallurgical bond between the third tube and the second tube.

4,518,112

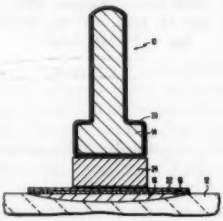
PROCESS FOR CONTROLLED BRAZE JOINING OF ELECTRONIC PACKAGING ELEMENTS

William R. Miller, Wappingers Falls, and Chandrika Prasad, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,920

Int. Cl.³ B23K *1/04*

U.S. Cl. 228—124 **3 Claims**



1. A method of forming a brazed bond between a flat surface of a I/O pin head and a flat surface of a metallized pad on a ceramic substrate of a semiconductor package comprising the steps of;

providing a Au metal layer on at least one of said flat pin head surface or said flat metallized pad surface,

placing the mask of a low melting Au-Sn alloy with a composition of 80% Au±5% with the balance being Sn between said pin head surface and said metallized pad surface,

heating the resultant assembly to a temperature in the range of 350° to 450° C.,

simultaneously with said heating, applying a pressure in the range of 250 to 2500 dynes/cm^2 to said surfaces sufficient to squeeze the major portion of the resultant molten Au-Sn alloy from between the surfaces, and cooling the assembly,

the bond between said pin head and said metallized pad formed of a relatively higher melting Au-Sn alloy resulting when the major portion of the alloy is removed allowing the major portion of the Sn in the small remaining portion of the alloy to combine with the Au layer to reduce the relative amount of Sn in the brazing bond alloy leaving a higher melting alloy.

4,518,113

ELECTROLYZER AND PROCESS

Alberto Pellegri, Luino, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

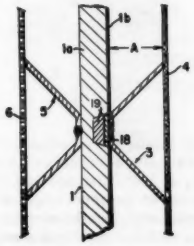
Division of Ser. No. 423,279, Sep. 24, 1982, Pat. No. 4,425,214, which is a division of Ser. No. 266,653, May 26, 1981, Pat. No. 4,389,298, which is a continuation-in-part of Ser. No. 128,972, Mar. 10, 1980, Pat. No. 4,279,731. This application Aug. 25, 1983, Ser. No. 526,417

Claims priority, application Italy, Nov. 29, 1979, 27690 A/79

The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.

Int. Cl.³ B23K *28/02*

U.S. Cl. 228—170 **2 Claims**



1. The method for electrically connecting valve metal anode ribs and cathodically resistant metal cathode ribs through a bipolar plate comprised of a valve metal sheet on the anode side and steel plate on the cathode side of the bipolar plate, comprising inserting bimetal strips with a valve metal side and a side of a highly conductive metal resistant to hydrogen migration into grooves cut on the steel plate side opposite to the valve metal sheet, welding the valve metal sheet and the valve metal ribs to the valve metal side of the bimetal strips inserted into the grooves of the steel plate and electrically connecting the cathodically resistant metal cathode ribs to the highly conductive metal side of the bimetallic strips.

4,518,114

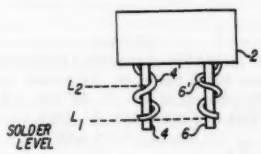
DIP SOLDERING APPARATUS AND METHOD

Thomas A. Walsh, Asbury, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 8, 1983, Ser. No. 520,961

Int. Cl.³ B23K *3/00, 1/08;* **H01R** *43/02*

U.S. Cl. 228—180.1 **2 Claims**



1. A method of soldering a pin to insulated wire wrapped around it in such manner that no wire is exposed, comprising

applying flux to the pin and the wire,

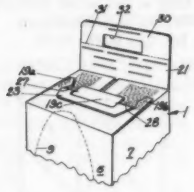
dipping the pin into a pool of solder to a point short of the level to which solder is ultimately desired and holding it in that position until the insulation is dislodged up to the said level, and

dipping the pin and wire wrapped around it farther into the pool of solder up to said level and withdrawing it from the pool before more insulation is dislodged.

4,518,115
INTEGRAL FLAP-CUT HANDLE FOR A CARTON

William E. Sedwick, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 276,732, Jun. 24, 1981, abandoned. This application Jan. 26, 1983, Ser. No. 461,078
Int. Cl.³ B65D 5/46
U.S. Cl. 229—52 B 2 Claims



1. An integral handle for a carton of the type having opposed pairs of side walls, a bottom wall, and a top wall, said top wall comprising at least first and second overlapping flaps hingedly connected to the upper edges of one of said opposed pairs of side walls, said handle comprising first and second handle elements, said first handle element having an inverted U-shaped configuration, said first handle element being die cut from the upper portion of said first flap by a pair of spaced cuts extending inwardly from the top edge of said first flap and by an inverted U-shaped cut having a base portion spaced inwardly from said top edge of said first flap and leg portions located between and spaced from said pair of inwardly extending cuts, said inverted U-shaped cut defining a finger-receiving aperture in said first handle element, said first handle element having a length less than the width of said first flap, said first handle element having a first handle element inside surface and being pivotable out of the plane of said first flap about score line hinges formed in said first flap and folded back upon said first flap, said second handle element being of greater length than said first handle element and comprising the entire width of the upper portion of said second flap as defined by score line hinges and at least one finger-receiving aperture in parallel spaced relationship to the upper edge thereof, said second handle element having a second handle element inside surface and being pivotable about said second flap score line hinges out of the plane of said second flap, said finger-receiving apertures of said first and second handle elements being in alignment when said handle elements are secured together, said first and second flaps being folded inwardly with portions of said second flap overlapping portions of said first flap, means for securing portions of said second flap to portions of said first flap and said second handle element inside surface to said first handle element inside surface.

4,518,116
AUTOMATIC DAMPER OPERATOR

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

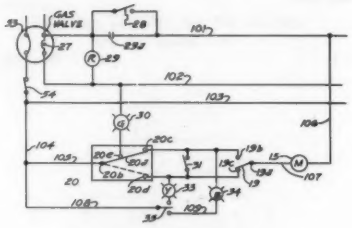
Continuation-in-part of Ser. No. 397,035, Jul. 12, 1982, abandoned. This application May 14, 1984, Ser. No. 608,931
Int. Cl.³ F23N 3/00
U.S. Cl. 236—1 B 5 Claims

1. Automatic damper operating means being a part of damper means, said damper means having enclosure means controlling and regulating the flow of a heating/cooling medium; said medium being transported through a duct network, said duct network originating at a heating/cooling device and terminating in a plurality of rooms and zones; said operating means comprising;

(a) transmission means,

said transmission means comprising motor means and linkage means; said motor means connecting to a first linkage of said linkage means through rotatable shaft means; said first linkage having energy storing and energy releasing means; said first linkage interconnecting said motor means and said damper blades, and transferring motor rotation to said damper blades; a second linkage of said linkage means rotatably interconnecting said multiplicity of blades; said blades being pivotally mounted in said enclosure means;

(b) control means,



said control means having thermostatic switch means, said thermostatic switch means controllably interconnecting and energizing said motor means and a fuel control means of a heating/cooling device,

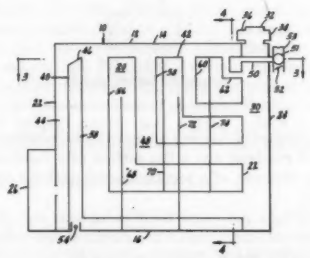
(c) indicating means,

said indicating means comprising visible means or like means connecting to said thermostatic means and communicating the operational status of said heating/cooling device and the open/closed status of said damper blades.

4,518,117
FURNACE STRUCTURE

Gerald A. Ijames, 15090 Manor, Detroit, Mich. 48238

Filed Apr. 18, 1983, Ser. No. 486,190
Int. Cl.³ F24B 7/00
U.S. Cl. 237—53 8 Claims



1. Furnace structure comprising a generally rectangular outer enclosure including a top, bottom, two sides, a front end and a back end, a blower at the front end of the outer enclosure, a cool air chamber adjacent the front end and top of the outer enclosure in communication with said blower for receiving cool air from the blower, a hot air chamber at the back end of the outer enclosure, a combustion gas chamber between the cool air chamber at the front end of the outer enclosure and the hot air chamber at the back end of the outer enclosure, a burner positioned in the combustion gas chamber adjacent the bottom and front thereof, four rows of heat exchange tubes extending from the cool air chamber at the top of the outer enclosure to the hot air chamber through the combustion gas chamber spaced apart from the front to the back of the combustion gas chamber wherein the first row of heat exchange tubes are two inch diameter tubes, the second row of heat exchange tubes are one and a half inch diameter tubes, the third

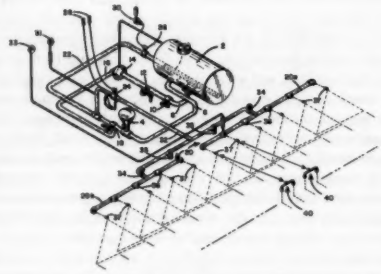
row of heat exchange tubes are one inch diameter tubes and the fourth row of heat exchange tubes are one half inch diameter tubes whereby fuel and air burned in the burner creates combustion gas in the combustion gas chamber which moves around the heat exchange tubes in the combustion gas chamber and heats air therein passing between the cool air chamber and hot air chamber.

4,518,118

MODULAR LOW PRESSURE STRIP SPRAYING APPARATUS AND SYSTEM

Harry H. Takata, Minneapolis, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,388
Int. Cl.³ B05B *1/14, 9/20;* A01G *25/09*
U.S. Cl. 239—163 **2 Claims**



1. Apparatus for converting a transportable broadcast spray application system, wherein liquid fertilizers or the like are pumped from a storage tank and supplied at a regulated pressure within the range of 10 to 60 psi to a plurality of spaced apart primary outlet ports attached along a primary delivery manifold, over to strip application, comprising, in combination:

a plurality of self-aligning couplers attachable to each of said outlet ports, each coupler comprising (1) a female body portion threadably attachable to one of said outlet ports and having a bore extending along a flow axis and at least one pivotal locking cam and (2) a male body portion detachably mountable in said bore in engagement with said locking cam and in fluid flow communication with said primary manifold, and each of said couplers including at least one replaceable sharp-edged primary metering disc having a flow determining orifice of a predetermined fixed size formed therethrough along said flow axis;

a plurality of secondary manifolds, each attached to one of said male body portions and "T" mountable to said primary manifold and each including at least two secondary outlet ports displaced therealong in parallel relation to said primary manifold, each of said secondary outlet ports including at least one sharp-edged replaceable secondary metering disc having a flow determining orifice of a predetermined fixed size formed therethrough along said flow axis; and wherein

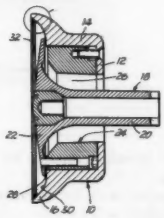
the aperture size of each of said primary and secondary metering discs for each secondary manifold is selected so that in combination the liquid fertilizer is strip applied at each secondary outlet port at a constant pressure regulated by said primary and secondary metering discs to be less than 10 psi.

4,518,119

SPRAYER

Kurt Vetter, Remseck, Fed. Rep. of Germany, assignor to Hermann Behr & Sohn GmbH & Co., Ingersheim, Fed. Rep. of Germany

Continuation of Ser. No. 313,090, Oct. 20, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,504
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040136
Int. Cl.³ B05B *3/10*
U.S. Cl. 239—223 **9 Claims**



1. In a rotatable, electrically chargeable, substantially bell-shaped sprayer for producing a paint mist from an axially fed liquid paint such as 2-component lacquers, for an apparatus for the electrostatic application of sprayed charged particles of the paint mist onto an article, the sprayer having an inner annular coaxial flowover surface for said liquid paint fed thereto via an inlet for the liquid paint and an annular lip which projects axially forwardly on a radial and axial outermost edge portion of the inner annular coaxial flowover surface, said outermost edge portion of the inner annular coaxial flowover surface being provided with grooves for channeling the flow of the liquid paint, the grooves being uniformly distributed on the circumference of said outermost edge portion of the inner annular coaxial flowover surface and extend approximately in the direction of the flow of said liquid paint, said grooves terminating open at a spray position of said lip, the improvement wherein

said grooves form two sets of grooves, the grooves of each set extending substantially parallel to each other and intersecting said grooves of the other set of grooves at intersection regions,

said grooves have a uniform cross-section along their entire length between said intersection regions,

said grooves are substantially linear along their entire length,

said outermost edge portion of the inner annular coaxial flowover surface has a substantially radially inwardly directed elevation on said flowover surface, said elevation defining a radially inwardly facing surface coaxial to said annular coaxial flowover surface, said grooves are formed in said elevation and have a bottom of the grooves passing continuously into an adjacent portion of said flowover surface,

said grooves have a symmetrical V-shaped cross-section and divide said elevation into a plurality of substantially truncated pyramids arranged substantially parallel to each other and each of said truncated pyramids having four lateral sides with a parallelogram base, only two adjacent sides of adjacent of said pyramids respectively defining the V-shaped and uniform cross-section and linearity of the grooves along their entire length between said intersection regions, and

said grooves disposed for channelling said liquid paint into at least a first and a second coherent thread of liquid, each of said threads extending beyond said sprayer edge by a measurable distance and substantially all of said threads extending substantially the same said measurable distance beyond said sprayer edge.

4,518,120

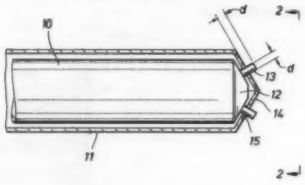
NON-FOULING OIL ATOMIZATION TIP

Gregory L. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 409,374, Aug. 18, 1982, abandoned. This application May 16, 1984, Ser. No. 610,931

Int. Cl.³ B05B *7/06*

U.S. Cl. 239—424 **3 Claims**



1. An oil atomizer suitable for use with a heavy liquid fuel comprising:

an elongated barrel for delivery of the heavy liquid fuel to an atomization zone;

spray tubes in the atomization zone arranged about the periphery of a cap terminating the elongated barrel;

a separated shroud surrounding the elongated barrel and operable at temperatures of 800° to 1600° F. to burn off coke accumulating thereon, the shroud and barrel permitting passage of fluid therebetween; and

a shroud tip terminating the shroud and enclosing the cap, the spray tubes being inserted through openings in the shroud tip a distance about 1 to 3 times the outside diameter of the spray tubes, the openings being about 1.2 to 3 times the outside diameter of the spray tubes, which permit passage of fluid around the spray tubes.

4,518,121

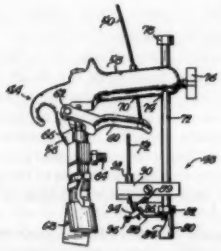
BEAD DISPENSER FOR PAINT STRIPER

David H. Smith, Redwood City, Calif., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Sep. 2, 1982, Ser. No. 414,005

Int. Cl.³ B05B *1/28, 7/02, 9/01*

U.S. Cl. 239—526 **9 Claims**



1. An improved spray gun and bead dispenser assembly for a paint striper, comprising an airless spray gun of the hand-held type having an inlet for connection with a supply of paint under pressure, a handle having a passage therethrough, a spray nozzle and a trigger for actuating said gun to emit a spray of paint from said nozzle; and a bead dispenser including a hollow tube extended through and secured in said handle passage, said tube having an inlet end for connection with a supply of reflective beads under pressure and an outlet end forwardly of said handle, valve means for controlling a flow of beads through said tube for emission from said outlet end, and a deflector means connected with said tube outlet end for deflecting beads emitted therefrom into a spray of paint from said spray gun for entrainment therein and deposit with said paint spray in a stripe on a surface.

4,518,122

HAND-OPERATED HOSE FOR ATOMIZING A LIQUID FOR THE TREATMENT OF PLANTS

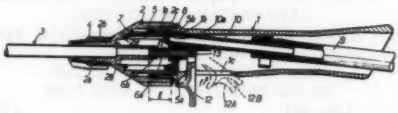
Patrick J. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Continuation of Ser. No. 406,553, Aug. 9, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 642,715

Claims priority, application France, Aug. 13, 1981, 81 15674

Int. Cl.³ B05B *9/08*

U.S. Cl. 239—530 **15 Claims**



1. A hand operated hose for atomizing a liquid, especially a liquid useful in the treatment of plants, said hose comprising a rigid tubular handle having a wall, a rear end and a front end with an outer thread, a transverse base plate separately inserted in said tubular handle near to its front end, said transverse base plate having first and second holes therein, an elongated closing member tightly and slidingly mounted through said first hole in said transverse base plate, a control trigger engaged through a longitudinal slot in the handle wall, said control trigger having an inner end connected to one end of said elongated closing member for sliding said member through said first hole, a tubular-shaped filter having a cross-sectional size substantially less than the cross-sectional inner size of the front end of said tubular handle and at least partially engaged in the front end of said tubular handle in a substantially coaxial relationship to said handle, a box-nut threadedly engaged on the outer thread of the front end of said handle, said box-nut being adapted to fix said tubular-shaped filter so that the inner end of said filter tightly engages said transverse base plate and an annular chamber is defined between respective walls of said tubular-shaped filter and of said box-nut, said second hole being located in said transverse base plate so as to open in said annular chamber, said box-nut having a first inner tubular part engaged in said tubular-shaped filter and forming a tight seat for the other end of said closing member, an atomizing head, conduit means to connect the tubular part of said box-nut to said atomizing head, and conduit means to feed the liquid to the atomized through the rear end of said hollow handle up to said second hole in the transverse base plate.

4,518,123

METHOD FOR CONTROLLING THE PULVERIZATION AND DRYNESS OF FLAMMABLE MATERIALS PASSING THROUGH A PULVERIZER, AND METHOD OF CONTROLLING THE PULVERIZING RATE OF THE PULVERIZER

Kazuo Tanaka, Kobe; Kenjiro Motonaga, Nishinomiya, and Kozo Tanaka, Miki, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 462,716, Feb. 1, 1983,. This application Jul. 23, 1984, Ser. No. 632,694

Int. Cl.³ F23K *1/00*

U.S. Cl. 241—18 **7 Claims**

1. A method for controlling a system of pulverizing and drying a flammable material, said method comprising:

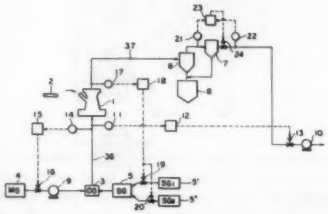
supplying said flammable material to a pulverizer operated by a pulverizer motor;

mixing a main dry gas and a temperature regulating gas to form a mixed gas;

using a push blower to feed said mixed gas into said pulverizer, so as to dry said material;

using a pull blower having a suction damper to discharge a mixture of said mixed gas and pulverized material to a separator;

performing a pressure control step of measuring the pressure of said mixed gas to one on an inlet or an outlet of said pulverizer and adjusting one of said blowers in response to said measured pressure so as to maintain the average pressure in said pulverizer substantially at atmospheric pressure;



performing a flow rate control step of measuring the flow rate of said mixed gas through said pulverizer and adjusting the forced flow rate of another of said blowers in response to said flow rate measurement so as to maintain the flow rate of said mixed gas at a constant value;

performing a temperature control step of measuring the temperature of said mixed gas at said outlet portion of said pulverizer and adjusting the mixing ration of said temperature regulating gas to said main dry gas in response to said measured temperature so as to maintain said measured temperature at a constant value.

4,518,124

CROP COMMINUTING APPARATUS HAVING VIBRATING CUTTING BLADES

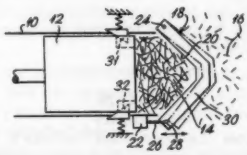
Wilfred E. Klinner, Milton Keynes, and Andrew C. Knight, Dunstable, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 501,052, Jun. 8, 1983, abandoned, which is a continuation of Ser. No. 192,036, Sep. 29, 1980, abandoned. This application Feb. 13, 1984, Ser. No. 578,983

Claims priority, application United Kingdom, Oct. 2, 1979, 7934214

Int. Cl.³ B02C *21/02*

U.S. Cl. 241—101.7 **9 Claims**



1. An apparatus for comminuting cut crop comprising an advancement duct, comminuting means providing a plurality of cutting edges extending along and at least in combination spanning, a cross-sectional dimension of the duct, and advancement means for moving a compressed column of the cut crop along the duct towards the comminuting means, each cutting edge being arranged to cut the column along a cutting plane containing that edge and lying substantially parallel to the direction of crop advancement through the duct, and drive means for vibrating the cutting edges in directions lying substantially parallel to said cross-sectional dimension of the duct with said drive means vibrating alternate ones of said cutting edges in anti-phase relative to the remaining ones of said cutting edges.

4,518,125

CRUSHERS

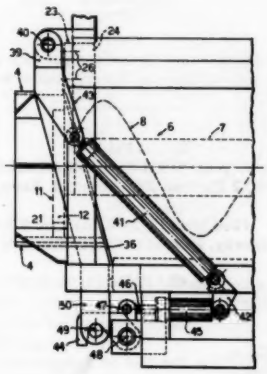
Lennart Boysen, Smedjegatan 8, S-384 00 Blomstermåla, and Ulf Ottoson, Långemåla, S-570 76 Ruda, both of Sweden

Filed Oct. 28, 1982, Ser. No. 437,255

Claims priority, application Sweden, Nov. 12, 1981, 8106727

Int. Cl.³ B02C *19/22*

U.S. Cl. 241—141 **5 Claims**



1. In an improved crusher for solid waste such as woodwaste and other wood containing waste material, said crusher being of the type comprising a container having at least one inlet opening and at least one outlet opening for the waste and a rotatable waste feeding and disintegrating screw extending between said inlet and outlet; wherein the improvement comprises a plate pivotally mounted on said container for movement between an operative and retracted position, a tube mounted on said plate in a position so that it is in axial alignment with said screw when said plate is in said operative position for defining said outlet opening, a cutting means comprising a planar cutter fixedly mounted on the end of said screw and being disposed within said tube when said plate is in said operative position, whereby said cutting means can be freed from non-crushable material by pivoting said plate from said operative position toward said retracted position.

4,518,126

TAKE-UP MECHANISM

Bryce G. Marshall, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

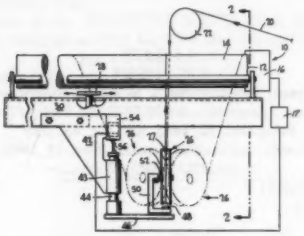
Filed Jul. 6, 1983, Ser. No. 511,417

Int. Cl.³ B65H *54/02, 54/20, 57/28, 59/38*

U.S. Cl. 242—18 R **18 Claims**

1. In a take-up mechanism for winding a strand comprising a winding mechanism for receiving a strand to be wound, a drive mechanism for driving said winding mechanism, and drive control means for controlling the winding speed of said drive mechanism, including a compensator wheel unit, the improvement wherein said compensator wheel unit includes a mounting arm, a support mounted on said mounting arm for pivotal movement about a first axis fixed relative to said mounting arm, and a compensator wheel carried by said support for rotation relative to said support and for pivoting with said support about said fixed axis, said first fixed axis being aligned

with the path of a strand to said compensator wheel, and means mounting said mounting arm for movement in accordance

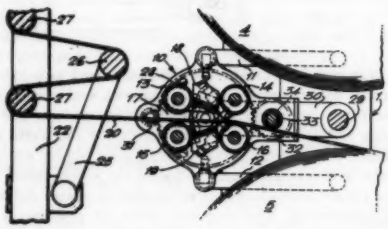


with strand loop tension on said compensator wheel to actuate said drive control means to thereby control winding speed.

4,518,127
WEB SPLICING APPARATUS

Peter Hurst, 2 Fleethall Rd., Rochford, Essex, SS4 1NF, England

Filed Mar. 15, 1983, Ser. No. 475,488
Claims priority, application United Kingdom, Mar. 31, 1982, 8209478
Int. Cl.³ B65H *19/10, 19/18*
U.S. Cl. 242—58.3 **4 Claims**

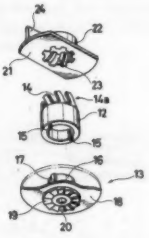


1. Web splicing apparatus for use in a reelstand having static positions for at least two reels, said apparatus comprising means for rotating a fresh reel on the reelstand, web guiding means for guiding a portion of an expiring web into a position adjacent to the periphery of the fresh reel, and web moving means for moving the expiring web into contact with the periphery of the fresh reel to cause web splicing when the speeds of the fresh reel and the expiring web have been synchronized, the web guiding means comprising a carrier, means mounting the carrier for movement between the reels, a sub-carrier rotatably mounted on the carrier, a set of guide members mounted on the sub-carrier for orbital motion about the axis of rotation of the sub-carrier, the guide members being mounted parallel to one another in a substantially rectangular configuration and being equispaced about and parallel to the said axis, the set of guide members comprising two pairs of guide members, the web moving means comprising a web moving device associated with each said pair of guide members, the guide members being moveable between a rest position in which the expiring web passes between one pair of the guide members and the other pair of the guide members, and a position in which the expiring web is constrained to follow a sinuous path about the guide members in which position one pair of the guide members presents a length of the expiring web to the fresh reel and the associated web moving device is brought into proximity to the presented length of the expiring web.

4,518,128
CORRECTION TAPE TAKE-UP SPOOL ASSEMBLY FOR TYPEWRITER

Hiroaki Watanabe, 1526-17, Shinyoshida-machi, Kohoku-ku, Yokohama-shi, Kanagawa-kin,233, Japan

Filed Sep. 9, 1983, Ser. No. 530,486
Claims priority, application Japan, Sep. 13, 1982, 57-138731
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.8 **8 Claims**



1. An assembly for dispensing and winding a typecorrection tape one or more times under the influence of the holding and rotation mechanism of a conventional correction typewriter, comprising a correction tape unit including a pair of similar hollow cylindrical bobbins, connected by means of a length of correction tape adapted to be dispensed from one bobbin which is a dispensing bobbin in normal dispensing position, and wound onto the other bobbin which is a take-up bobbin in inverted take-up position, each said bobbin comprising a machine fastening means for engaging a holding mechanism of a typewriter, when in normal dispensing position, and also comprising a spool fastening means for a take-up spool, when the bobbin is in inverted take-up position, to prevent relative rotation between said bobbin and said spool, and a said tape take-up spool comprising a shaft having a lower drive means adapted for engagement by a rotation mechanism of a typewriter and also comprising a companion means for engaging said spool fastening means of said take-up bobbin in inverted position, the said take-up bobbin being secured on the shaft of said spool by engagement of said spool fastening means and said companion means, to permit said take-up bobbin to be rotated with said spool and cause said correction tape to be unwound from the dispensing bobbin onto the take-up bobbin under the influence of the typewriter mechanism, said correction tape unit being designed to be removed from said holding means and from said take-up spool, when the correction tape has moved from the dispensing bobbin to the take-up bobbin, inverted, and reattached with the original dispensing bobbin secured in inverted position to the shaft of the spool and the original take-up bobbin secured in normal position in engagement with the holding mechanism of fhe typewriter to permit the correction tape to be dispensed another time.

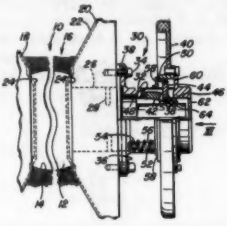
4,518,129
COILERS

Gérard G. M. Coté , La Prairie, and Bretislav P. Zuber, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 6, 1984, Ser. No. 628,625
Int. Cl.³ B65H *54/00*
U.S. Cl. 242—78 **5 Claims**

1. A coiler comprising a core with a peripheral surface to support a coil as it is being wound, and two coil side support members extending radially outwards, one at each side of the core, one of the support members forming part of a support member and detachment means assembly having an axial passage which receives a shaft extending axially of the core, the assembly comprising an axial extension of the support member, a release member and spring means, the release member ex-

tending radially outwards from and connected to the extension by a plurality of link devices spaced apart around the passage, the link devices allowing for axial movement of the release member along the extension and away from the associated support member into a locking position in which each link device is pivoted to engage an abutment on the shaft so as to



hold the assembly upon the shaft, axial movement of the release member out of the locking position serving to release the link devices from the abutment to allow detachment of the assembly, the spring means disposed to urge the release member into the locking position and thus urge the support member firmly into position against the core.

4,518,130

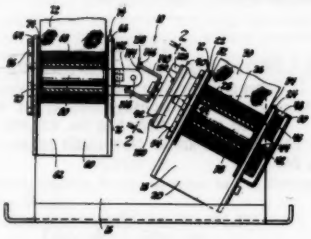
LAP AND SHOULDER BELT RETRACTOR

Lawrence A. Gloomis, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1984, Ser. No. 592,392

Int. Cl.³ A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **3 Claims**



1. A retractor for winding and storing the ends of lap and shoulder belts having their other ends joined together by a buckle element by which the belts may be disposed in restraining positions respectively about the lower torso and upper torso of a seated vehicle occupant comprising:

a housing;

a lap belt reel rotatably mounted on the housing and having the lap belt end attached thereto; a shoulder belt reel rotatably mounted on the housing and having the shoulder belt end attached thereto;

a main spring acting between the housing and the lap belt reel to urge rotation of the lap belt reel in the direction to wind the lap belt taut about the occupant lower torso; and

means coupling the shoulder belt reel with the lap belt reel so that the main spring urges rotation of the shoulder belt reel in the belt winding direction in unison with the lap belt reel, said coupling means also including an auxiliary spring interposed in the coupling relationship between the lap belt reel and the shoulder belt reel to enable unwinding rotation of the shoulder belt reel against the winding bias of the auxiliary spring and relative to the lap belt reel while the lap belt reel remains poised at its taut position about the stationary occupant lower torso.

4,518,131

INERTIAL ELEMENT FOR WINDING THE SAFETY BELT OF A MOTOR VEHICLE

Klaus Butenop, Herzhorn, and Klaus-Peter Singer, Hamburg, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

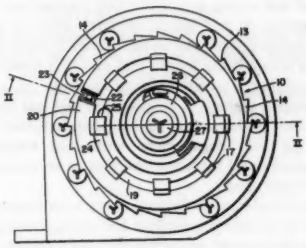
PCT No. PCT/DE82/00051, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/03207, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 11, 1982, Ser. No. 441,556

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109554

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 B **18 Claims**



1. An inertial element as the control mechanism for locking members of belt reeling mechanisms having at least belt-sensitive blocking of the belt winding spindle thereof; said inertial element comprising:

an inertial disc mounted on said belt winding spindle, said inertial disc being provided with at least two first projections;

a ring which, as a separate component, serves to increase the mass moment of inertia; said ring surrounding, yet being spaced from, the axis of said belt winding spindle; said ring being held by said first projections;

said inertial disc being provided with a second projection;

said ring being provided with a gap into which said second projection extends; and

a return spring connected between said inertial disc and said belt winding spindle for biasing said inertial disc in a predetermined direction relative to said winding spindle.

4,518,132

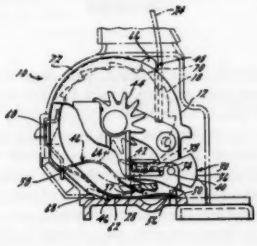
COMBINATION SEAT BELT RETRACTOR MECHANISM

Timothy J. Schmidt, Troy, Mich., assignor to General Safety Corporation, St. Clair Shores, Mich.

Filed Apr. 27, 1984, Ser. No. 604,592

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. A seat belt retractor which may be operated either as, an emergency locking retractor which prevents seat belt webbing from being withdrawn when the retractor is subjected to de-

celeration above a predetermined level, or as an automatic locking retractor which acts to retract said webbing but does not permit substantial withdrawal of said webbing comprising;

a retractor frame,

a spool rotatable within said frame and having at least one toothed sprocket,

a locking bar engageable with said toothed sprocket thereby preventing withdrawal of said webbing from said spool,

an inertia sensitive actuator acting upon said locking bar to cause engagement with said toothed sprocket when a deceleration level above said predetermined load is sensed,

a leaf spring attached to said retractor frame movable between a first and a second position, in said first position, said leaf spring permitting said locking bar to operate in response to said inertia sensitive actuator whereby said retractor operates as an emergency locking retractor, said leaf spring being forced into said first position when said spool has a predetermined quantity of said webbing wrapped thereon, whereas when said leaf spring is in said second position, said locking bar is forced by said leaf spring into engagement with said toothed sprocket whereby said retractor operates as an automatic locking retractor, and

a switching lever affixed to said retractor frame, said switching lever acting upon said leaf spring forcing said spring into said second position when said webbing is withdrawn from said spool.

4,518,133

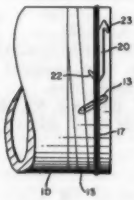
YARN PACKAGE

Broadus E. Hill, Jr., Wilmington, N.C., assignor to E. I. Du Pont de Nemours and company, Wilmington, Del.

Filed Aug. 20, 1984, Ser. No. 642,434

Int. Cl.³ B65H *55/00*

U.S. Cl. 242—165 **2 Claims**



1. In a yarn package structure including a package support having a main body of yarn, a yarn transfer tail consisting of a plurality of helical turns leading to said main body of yarn, a plurality of circumferential turns of yarn located in a circumferential stringup groove adjacent one end of the package support leading to said transfer tail, and a surface cavity on the package support intersecting the plane of said stringup groove, a means for pulling the circumferential turns of yarn over the end of the package support, comprising: a tab having a hook formed on one end, said hook being positioned between said package support and said circumferential turns of yarn and being held in place thereby, the other end of said tab being positioned above said circumferential turns to provide a finger grip.

4,518,134

MAGNETIC TAPE CASSETTE

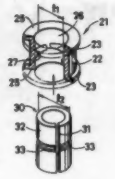
Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,640

Claims priority, application Japan, Apr. 21, 1983, 58-58683[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **5 Claims**



1. In a magnetic tape cassette having rotary guide rollers arranged at both ends of the front part of said cassette for guiding the running of a magnetic tape, the improvement comprising:

a cylindrically shaped shaft supporting each rotary guide roller, said shaft having a slit formed in the axial direction thereof, an outer wall, and a circumferential annular groove formed in said outer wall in a middle region thereof;

each said rotary guide roller having an inner wall and circumferential engaging protrusions, protruding from said inner wall in a middle region thereof;

said supporting shaft being inserted into said rotary guide roller to fit said engaging protrusions into said annular groove so that said rotary guide roller is pivotally mounted on said supporting shaft.

4,518,135

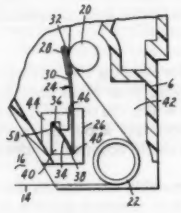
SLACK LIMITER FOR A MAGNETIC TAPE CASSETTE

Charles D. Gebeke, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 5, 1983, Ser. No. 520,606

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **7 Claims**



1. In a cassette including a housing, an access opening, at least one reel and a length of tape wound upon the reel and extending across the access opening, the improvement comprising:

a slack limiter of a thin, flexible, resilient material including an elongate tab portion terminating in a contact end adapted to engage the tape and bias the tape in a direction transverse to the elongation of said tab and a mounting portion spaced from said contact end and including a fold and a compression member extending from said fold at an acute angle to said tab portion; and

means for mounting said slack limiter to said housing including walls parallel to said fold which engage said fold and the end of said compression member opposite said fold

and compress said compression member into a bowed configuration so that the resiliency of said compression member forces said fold and said opposite end of said compression member against said walls.

4,518,136

DEVICE FOR COLLECTING SPOOLS

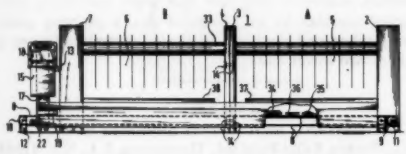
Joachim Rohner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,802

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223593

Int. Cl.³ B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **6 Claims**



1. Device for collecting ejected wound, partially wound, or empty spools at the working stations of an automatic spool winding machine, comprising means guided along the working stations for horizontally transporting the spools; at least two laterally spaced apart mounting devices disposed in vicinity of said transporting means; at least one spool removal device mounted to one of said mounting devices and removable for mounting on another of said mounting devices, said spool removal device including a spool diverting device downstream of said transporting means for receiving the spools, a spool lifting device for lifting the spools from said diverting device, and a spool collecting container for receiving the spools from said lifting device and holding them in a fixed position; and means for transmitting motion of said transporting means to said spool lifting device for driving said spool lifting device.

4,518,137

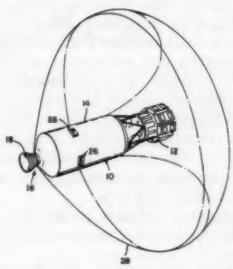
AERODYNAMIC BRAKING SYSTEM FOR A SPACE VEHICLE

Dana G. Andrews, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 1, 1979, Ser. No. 90,296

Int. Cl.³ B64G *1/58*

U.S. Cl. 244—113 **17 Claims**



1. An aerodynamic braking system for a space vehicle comprising a main rocket motor having a nozzle oriented to discharge propulsive gases from one end of the vehicle, wherein during use of the system the space vehicle will be traveling toward the earth's atmosphere nozzle end first, said aerodynamic braking system comprising:

an aerodynamic braking member carried by the space vehicle and movable prior to its use from a stowed position aboard the vehicle outwardly into an operational position in which it presents a large area braking surface extending generally laterally outwardly from the space vehicle; and

means for producing gases within said main rocket motor, for discharge outwardly through the rocket nozzle, at a rate sufficient to provide a gaseous cooling layer along the anterior surface of the aerodynamic braking surface, but without substantially reducing the drag of the braking surface, so that such braking member will remain effective and reduce the velocity of the space vehicle down to a desired level.

4,518,138

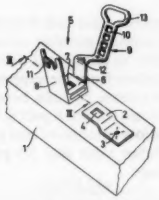
FASTENING DEVICE

Paul Stutenkemper, Pulheim; Heinz Rest, Cologne, and Herbert Kloppe, Pulheim, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 252,109, Apr. 8, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,705

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—73 **7 Claims**



1. Fastening device to hold leads, wires, carpets, panelling and the like to a structure, consisting of a mount fixed to a structure with a holding bracket set off from the surface of the structure, with which a flexible terminal clamp can be engaged, characterized in that the bracket is shaped in the form of a bent clasp having one end welded to the structure and its other end free and set off from the surface of the structure and having an aperture formed through its free end, the flexible clamp includes a sleeve-shaped base portion having an outer surface directly engageable with the leads, wires, carpets, panelling and the like, and surfaces internal thereto for receiving the clasp free end therein, and the base portion includes a latch portion adjacent to but carried entirely internally of the outer engaging surface for lockingly engaging the clasp aperture and the flexible clamp includes a flexible strap portion fixed at one end to the base portion and lockingly engageable at its free end to the base portion to clampingly engage the leads, wires, carpets, panelling and the like directly against the base portion outer surface.

4,518,139

SEAT PEDESTAL

Don L. Barfell, Elkhart, Ind., assignor to Elkhart Machine & Tool Co., Inc., Elkhart, Ind.

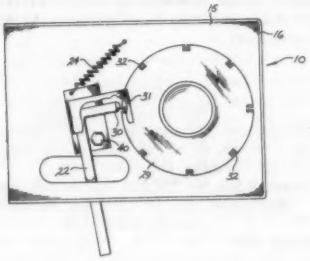
Filed Sep. 12, 1983, Ser. No. 531,018

Int. Cl.³ A47C *1/00*

U.S. Cl. 248—418 **3 Claims**

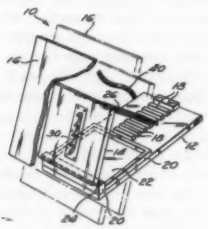
1. In a pedestal for a rotatable seat including a base, a support member extending upwardly from said base, a plate member adapted to carry said seat supported by said support member, said plate member being rotatable relative to said support member and being detachable from the support member upon lifting movement, releasable lock means for preventing rotational movement of said plate member relative to said support member, the improvement wherein said support member in-

cludes a radially extending annular flange, said lock means being shiftably connected to said plate member and including a latch part shiftable in a substantially horizontal plane between a lock position in engagement with said support member flange preventing said plate member rotational movement and a full release position detached from the support member flange, said lock means including a lip positioned under said support member flange when said latch part is in its said lock position to prevent said detachable lifting movement of the plate member



from the support member, said lock means lip being positioned out from under said support member when said latch part is in its full release position to allow said detachable lifting movement of the plate member from the support member, said latch part having a partial release position between its lock and full release positions wherein the latch part is disengaged from said support member to allow rotation of said plate member relative to said support member with said lip positioned under said support member flange.

4,518,140
DRAWING BOARD ASSEMBLY
John J. Ferranto, 1730 Diego Way, Oxnard, Calif. 93030
Filed Apr. 21, 1980, Ser. No. 142,431
Int. Cl.³ A47G *1/24*; C09D *11/00*
U.S. Cl. 248—456 **6 Claims**



1. A drawing board assembly comprising:

a base, said base having a fore edge and an aft edge and an upper surface and a lower surface, said lower surface adapted to be located upon a planar supportive surface, said upper surface including stop means;

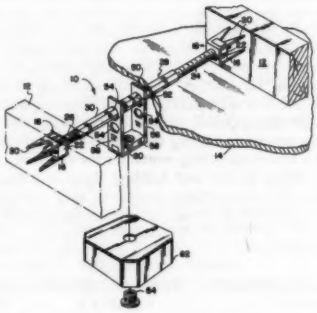
a backing board having a front side and a back side, said back side being hingedly connected to said upper surface at said fore edge, said front side including pivot means;

brace means connected to said back side of said backing board, said brace means to releasably engage with said stop means causing said backing board to assume an inclined position relative to said base, when said drawing board assembly is to not be in use said brace means is to be disengaged from said stop means permitting said backing board to be parallel and directly adjacent said base;

a drawing board having a front side and a back side, said front side being adapted to function as an operating surface, a pivot pin centrally mounted on said back side, said pivot pin adapted to releasably connect with said pivot means permitting pivoting of said drawing board relative to said backing board solely upon application of sufficient manual force; and

said pivot means comprising a plurality of separate pivoting points, said pivot pin being capable of connecting with any one of said pivoting points thereby adjusting the location of said drawing board in respect to said backing board, each said pivoting point being formed by a transverse slot with there being a plurality of said transverse slots located in a spaced apart manner, each said transverse slot having an open upper end and a closed lower end, said closed lower end of each said transverse slot being located nearer said base than its respective said upper end when said backing board is in said inclined position relative to said base, said upper ends being connected together by an elongated slot, a pivoting point being when said pivot pin is located directly adjacent a said closed lower end.

4,518,141
CEILING MOUNTING ASSEMBLY
Robert L. Parkin, 9 Old Field Rd., Huntington, L.I., N.Y. 11743
Filed Sep. 29, 1982, Ser. No. 426,715
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—546 **2 Claims**



1. A ceiling fixture mounting assembly insertable through a ceiling opening disposed intermediate a pair of overlying ceiling joists comprising,

an elongate support member sizeable to be accommodated between said joists and having a pair of oppositely threaded end portions extending outwardly from an unthreaded planar surfaced midportion;

a joist-engaging block member threadedly mounted on each of said extending end portions of said support member adapted for individual axial displacement thereon in response to induced rotative displacement of said midportion of said support member relative thereto;

prong means extending outwardly from each of said joist-engaging block members for penetrational embedment in said joists in response to outwardly directed axial displacement of said block members;

fixture hanger means slideably positionable along said support member for selective location relative to said ceiling opening;

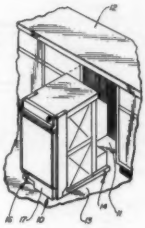
means associated with at least one of said joist-engaging blocks for preventing rotative displacement thereof in response to rotative displacement of said elongate support member prior to prong means embedment in said ceiling joists;

said last mentioned means being adjustable in length and serving to locate the locus of prong embedment in said joist.

4,518,142
SUPPORT AND LEVELING SYSTEM FOR REFUSE COMPACTOR

Charles E. Sulcek, Boyle County, and Frank E. Miller, Mercer County, both of Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 20, 1981, Ser. No. 285,398
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—649 **30 Claims**



1. In an appliance having a base defining a front portion, a rear portion, and a downwardly facing base surface, means for leveling and supporting the appliance on a subjacent supporting surface comprising:

support means on the rear portion of the base;

a pair of laterally spaced support elements on the front portion of the base, each support element defining an axis of pivoting extending in a front-rear direction and further defining a lower support surface having portions at different spacings from said axis and an upper arcuate support surface defined by a radius about said pivot axis; and

mounting means for mounting said support elements to said base for pivotal, non-rolling movement about said axis, with said lower support surface slidably resting on said subjacent supporting surface to define any one of a plurality of different height supports of said base front portion, said mounting means being adjustable from the front of the base by effecting selective pivoting of the support element about said front-rear pivot axis, said upper support surface engaging said downwardly facing base surface.

4,518,143
MOLD FOR FORMING A CONTAINER HAVING A PIVOT MEANS

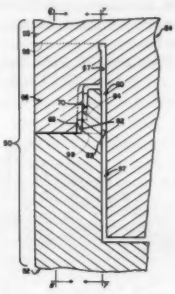
Henry J. Blanchette, Leominster, Mass., assignor to Plastican, Inc., Leominster, Mass.

Division of Ser. No. 350,145, Feb. 19, 1982, abandoned. This application Apr. 3, 1984, Ser. No. 596,243
Int. Cl.³ B29C *1/00*; B29F *1/00*
U.S. Cl. 249—142 **1 Claim**

1. Apparatus for molding a container having unitary bail supporting means, said apparatus comprising an open-ended mold cavity having an inner surface defining an exterior portion of said container and a mating mold core having an exterior surface defining an interior portion of said container, wherein:

said cavity is provided with a plurality of interior keyways adjacent the open end of said mold cavity, each of said keyways being provided with a centrally disposed post having a surface contiguous with said inner surface of said cavity and a spaced apart surface bearing a centrally disposed elongate tongue extending partially along said post; and

said core is provided with an exterior flange depending from which are a like plurality of exterior keys disposed and dimensioned to mate with said keyways, said keys being spaced apart from and confronting said inner surface, each of said keys incorporating a recess dimensioned and disposed to accommodate in confronting spaced-apart relationship a one of said posts, and each of said recesses being provided with a centrally disposed elongate pad extending

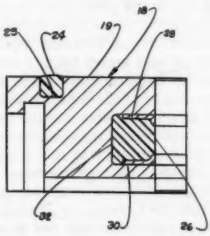


partially along said recess and being dimensioned and disposed so as to in part contact said tongue along a surface substantially concentric with said inner surface.

4,518,144
RAM-TYPE BLOWOUT PREVENTER AND PACKER THEREFOR

John C. Vicic, Houston; Carl A. La Velle, Spring, and Joe P. Parris, III, Magnolia, all of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Sep. 1, 1983, Ser. No. 528,551
Int. Cl.³ E21B *33/06*
U.S. Cl. 251—1 A **13 Claims**



1. A ram-type blowout preventer comprising

a housing having a bore with aligned ram guideways extending through the housing from opposite sides of said bore,

a ram in each of said ram guideways,

means for moving the rams inwardly and outwardly in said guideways,

a removable ram-front packer in each of said rams including a packing having a front face, and

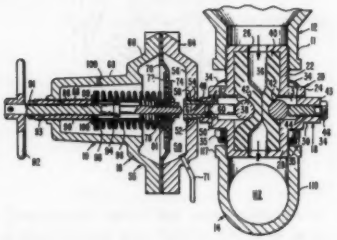
an upper plate embedded in the upper portion of the packing,

said upper plate having a front portion having a vertical dimension greater than the vertical dimension of its rear portion so that pressure on the packing ensures that the upper plate maintains sufficient support for said packing when closed.

4,518,145
VALVE FOR REGULATING THE PRESSURIZED FLOW OF ABRASIVES, IN PARTICULAR BLAST MEDIA

Douglas Keitz, Levittown, and Robert Heaton, Bristol, both of Pa., assignors to Empire Abrasive Equipment Corporation, Langhorne, Pa.

Filed Sep. 28, 1982, Ser. No. 425,837
Int. Cl.³ F16K 7/07
U.S. Cl. 251—5 **25 Claims**



1. A valve for controlling flow from an outlet of a pressurized tank containing abrasive media to a remote point of discharge, comprising:

(a) a pinch tube housing of tubular formation defining a pinch tube chamber therein, said housing being formed open at both ends and having intermediate its ends transversely aligned portions having diametrically opposed side openings communicating with the chamber, said housing having one end adapted for connection to said outlet, the other end of the housing being adapted for discharge into a conduit that has a connection to a source of pressure fluid and leads to said discharge point;

(b) a pinch tube within said chamber adapted to be constricted radially so as to at times regulate the media flow and at other times stop said flow completely, said side openings opening upon opposite sides of the pinch tube, each of said opposite sides being deformable radially inwardly of the tube independently of the other side;

(c) first and second tube-constricting means within the housing disposed at opposite sides of the tube, said means being disposed within the pinch tube chamber between the side openings and the respective, opposite sides of the pinch tube in direct contact with said opposite sides of the pinch tube, each of said means being movable inside the pinch tube chamber independently of the other means in a direction transversely of the tube for constricting it radially;

(d) plunger means extending into the housing through one of said side openings and engaging one of said tube-constricting means for shifting it in said direction; and

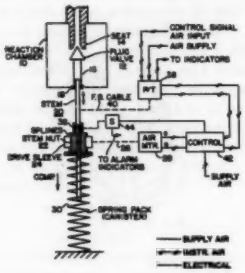
(e) means extending through the other side opening engageable with the other tube-constricting means and operable from outside the housing for adjusting the position of said other means relative to said one means.

4,518,146
VALVE OPERATOR CONTROL SYSTEM

Walter J. Stinson, and Larry J. Phillips, both of Houston, Tex., assignors to General Signal Corporation, Stamford, Conn.

Filed Apr. 28, 1983, Ser. No. 489,683
Int. Cl.³ F16K 31/128
U.S. Cl. 251—28 **6 Claims**

1. In a control system for a valve having a valve actuator, an absolute position responsive servomechanism operating said valve actuator for motivating the movable member of said valve toward and away from the seat of said valve which is subject to thermal displacement, and a compression spring coupled to said valve member and biasing said valve member against said seat upon engagement of said valve member with said seat, the improvement comprising sensor means for detecting the displacement in compression of said spring to a plurality of positions, a first of which positions corresponds to a predetermined spring load of said valve member against said seat and a second of which positions corresponds to an overcompression of said spring, and means operative independently of said position responsive servomechanism for inhibiting the motivation of said valve by said servomechanism when a displacement of said spring to said first position is detected by said sensor means and for operating said servomechanism to displace said valve member away from said second position back towards said first position when a displacement of said valve member to said second position is detected by said sensor means whereby to maintain the compression of said spring and the bias of said valve member against said seat in a preset range when said servomechanism brings said valve to its closed position, in spite of thermal displacement of said seat to prevent any overcompression of said spring.



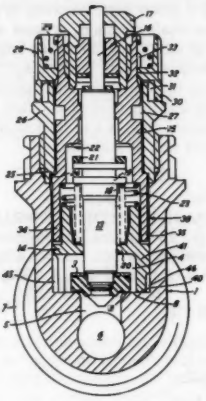
4,518,147
VALVE WITH PRESETTING OF THE AMOUNT OF THROUGHFLOW

Erik E. Andresen, and Svend P. Pedersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 30, 1983, Ser. No. 567,415
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300624
Int. Cl.³ F15B 13/02
U.S. Cl. 251—121 **6 Claims**

1. A thermostatic valve assembly, comprising, a housing having inlet and outlet connections and a valve controlled opening having a valve seat therebetween, said housing defining a cylindrically shaped valve chamber on one side of and coaxially aligned with said opening, said valve chamber having a cylindrically shaped wall with an ingress aperture providing fluid communication between said inlet connection and said valve chamber, said housing forming a base section for said valve chamber in surrounding relation to said valve seat, a valve closure member in said valve chamber cooperable with said valve seat, an adjustable throttle member rotatably mounted in said valve chamber in surrounding relation to said valve closure member, said throttle member having a spiral wall extending spirally relative to the axis of said valve seat which forms a variable throttle passage with said valve chamber cylindrically shaped wall and which enlarges and contracts relative to said ingress aperture when said throttle member is selectively rotated in opposite directions to form an adjustable cross section throttle passage, said spiral wall having an axial end thereof in sliding and sealing engagement with said base section in surrounding relation to said valve seat, said spiral wall being circumferentially discontinous to form a circumferential opening which forms a through passage providing fluid

communication between said throttle passage and said valve controlled opening, and setting means for rotating said throttle



member to provide varying desired throttling conditions between said ingress aperture and said valve controlled opening.

4,518,148

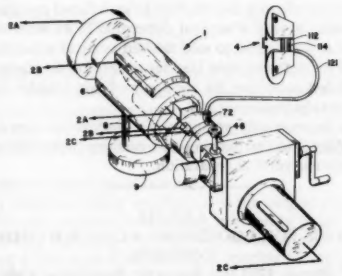
HYDRAULIC CHOKE DEVICE

Wesley E. Renfro, P.O. Box 1320, Houma, La. 70360

Continuation-in-part of Ser. No. 160,972, Sep. 26, 1980. This application Oct. 29, 1982, Ser. No. 437,734

Int. Cl.³ F16K *47/04, 31/05;* F16H *1/08*

U.S. Cl. 251—122 **7 Claims**



1. A hydraulic choking device to be installed on a high pressure fluid well member to control flow of fluids from the wells which comprises:

(a) A choke housing assembly having:

(i) A choke housing body provided with a passageway having an exit opening at one end and a ball nose plug entrance opening at its opposite end, the passageway being provided with a cavity in its sidewall perpendicular to the passageway, and provided with a shoulder stud perpendicularly attached to the housing body and having a fluid entry passageway opening into the housing body passageway directly opposite the cavity, the shoulder stud being attachable to the fluid well member for the fluid entry passageway to receive the well fluids,

(ii) A wear sleeve assembly attached to the choke housing body passageway sidewall at the exit opening end and having an entry wear sleeve and a down stream wear sleeve, the entry wear sleeve having an outwardly flared opening to receive the fluids and direct them through the down stream wear sleeve which is also provided with a flared opening to receive the fluids and direct them through an opening of a ball nose plug seat;

(b) An operator assembly having:

(i) An operator housing assembly attachable to the choke housing body and having an operator rod channel alignable with the choke housing body passageway and extending through the operator housing assembly, wherein the operating housing assembly comprises an operator nose section screwed to the choke housing body and an operator body section attached to the operator nose section,

(ii) An operator rod positioned in the channel and threading attached at one end to a threaded shaft, its opposite end extending toward the wear sleeve assembly, the operator nose assembly having a packing gland through which the operator rod passes in a sealing manner, wherein the operator nose assembly is provided with a weep hole located behind a packing gland to allow removal of any fluid which seeps past the packing gland, and

(iii) A ball nose plug attached to the operator rod's opposite end and extending toward the wear sleeve assembly, the plug having a ball nose shaped to sealingly seat in the ball nose plug seat when positioned therein,

(c) A drive assembly having a drive means drivingly attached to the threaded shaft to rotate the shaft and cause the ball nose plug to advance or retract from the choke housing body passageway.

4,518,149

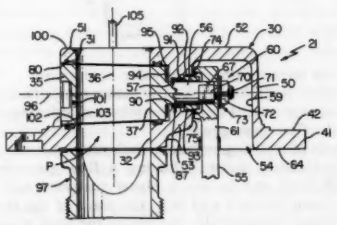
VALVE ASSEMBLY AND METHOD OF MAKING SAME

John F. Gardner, Loveland, Ohio, and David Hobson, Cambridge, Mass., assignors to Xomox Corporation, Cincinnati, Ohio

Filed Jan. 20, 1983, Ser. No. 459,462

Int. Cl.³ C11D *7/08*

U.S. Cl. 251—144 **28 Claims**



1. In a valve assembly for a fluid-containing tank which has a mounting saddle fixed to the bottom portion thereof, said valve assembly comprising, a housing structure having a central portion with a fluid inlet and a fluid outlet defined therein, means for mounting said housing structure against said saddle so that said housing structure and its said central portion are substantially within the confines of said tank, and bottom operable valve means carried by said housing structure and adapted to shut off fluid flow between said inlet and said outlet, the

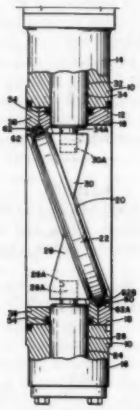
improvement wherein said inlet and said outlet are defined in said housing structure on a common rectilinear flow axis, said valve means has opening means which is adapted to be aligned between said inlet and said outlet on said rectilinear flow axis to define the open position of said valve assembly, said central portion has a top surface and has said inlet and outlet defined therein, said valve means is disposed between said inlet and outlet within the confines of said tank, said valve means has a drain opening therein which is disposed substantially perpendicular to said rectilinear flow axis, said drain opening having an outer end in flow communication with the fluid in said tank and an inner end in flow communication with said rectilinear flow axis with said valve means in said open position, said valve means once moved with its opening means aligned to define said open position enabling substantially free unobstructed flow of fluid through said valve assembly parallel to said axis and with minimum pressure drop to thereby enable the fluid in said tank above said top surface to be discharged through said valve assembly at a maximum rate of fluid transfer, and once the level of fluid in said tank is beneath said top surface of said central portion continued flow is through said drain opening to thereby allow complete drainage of any fluid in said tank.

4,518,150

VALVE WITH SPLIT RING RETAINER

Jimmy L. Greenburg, Broken Arrow, Okla., assignor to Dover Corporation, Tulsa, Okla.

Filed Sep. 6, 1983, Ser. No. 529,850
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—306 **8 Claims**



1. An improved butterfly valve comprising:

a valve body having a flow passageway therethrough and having coaxial top and bottom shaft openings intersecting the flow passageway;

a pair of seat ring retainers, each retainer being formed of a cylindrical sidewall having a flow passageway therethrough and having a planar rearward end face and a planar forward end face, the plane of the rearward face being perpendicular the axis of the flow passageway and the planar front face being at an acute angle to the plane of the rearward face, the forward face having a seat retaining groove therein, and each seat ring retainer having a shaft opening in the sidewall, the forward end faces of opposed seat rings when matingly assembled in said valve body forming a circumferential seat capturing groove therebetween, the shaft openings of the retainers when assembled being in alignment with said body shaft openings;

a toroidal seat ring received between said pair of retainers;

a disc having a circumferential sealing surface rotatably supported within said valve body and within said seat retainers; and

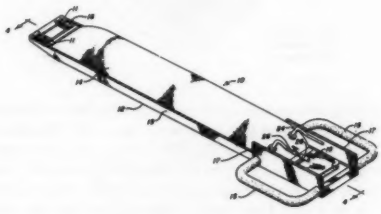
an upper and a lower shaft received in said body and said seat retainer shaft openings, at least one shaft extending externally of said body, the shafts engaging said disc for rotatably supporting and positioning the disc whereby in one position the circumferential sealing surface thereof engages said seat ring to close said flow passageway and in another position fluid is free to flow in the flow passageway to either side of said disc.

4,518,151

ARTICLE SEPARATOR FOR MATERIALS HANDLING

M. Reese Dill, Jr., 15 Carleton Rd., Belmont, Mass. 02178

Continuation-in-part of Ser. No. 343,460, Jan. 28, 1982, abandoned. This application Aug. 9, 1983, Ser. No. 521,609
Int. Cl.³ B66F *3/24*
U.S. Cl. 254—93 HP **7 Claims**



1. Portable apparatus for providing a desired vertical separation between materials normally stacked with a minimum vertical separation of no more than one inch, said apparatus comprising:

an elongated, inflatable bladder having a vertical dimension in a deflated condition less than said minimum vertical separation;

means for providing rigidity to said bladder in its direction of elongation for allowing manual pushing of said bladder between the materials, said providing means comprising:

a generally rigid frame at least partially surrounding said bladder, said frame having a thickness less than said minimum vertical separation, said frame being spaced from said bladder in both an inflated and a deflated condition; and

means for adjustably tensioning said bladder between portions of said frame;

means for inflating said bladder to an inflated condition, said bladder having a vertical dimension in its inflated condition at least equal to said desired vertical separation;

means for deflating said bladder to return said bladder to its deflated condition for recovery of said bladder from between the materials; and

means for manually grasping said bladder for carrying said bladder and for pushing said bladder manually into said minimum vertical separation.

4,518,152

DEVICE FOR LOOSENING A CABLE WITHIN A CONDUIT

Harry C. Pierce, 1785 Van Buren St., San Mateo, Calif. 94403, and Helen A. B. Bailey, 1984 Evergreen, La Verne, Calif. 91750

Filed Feb. 4, 1983, Ser. No. 464,005
Int. Cl.³ H02G *1/08*
U.S. Cl. 254—134.3 R **2 Claims**

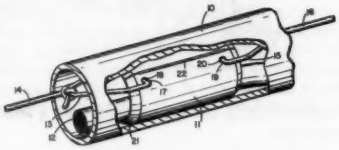
1. A device for freeing a cable adhering to the inside walls of a conduit, comprising:

a tubular sleeve having an outside diameter less the smallest

cross-sectional dimension of said conduit, said sleeve having an inside diameter greater than the outside diameter of a cable to be freed from adherence to an inside wall of said conduit;

means for attaching a draw line to said sleeve for drawing said device through said conduit with said cable feeding through said sleeve inside diameter;

a nose portion at least at one end of said sleeve, said nose portion comprising internal and external circumferential chamfers at the same end of said nose portion, said internal



chamfer exerting a prying action against said cable as said device is drawn through said conduit, said external chamfer together with said internal chamfer acting to provide a knife edge, said nose portion being rotatably associated with an end of said sleeve but with capture means such that the longitudinal center lines of said nose portion and the remainder of the length of said sleeve remain substantially coincident without longitudinal separation therebetween, said capture means also limiting the relative rotation of said nose portion and said sleeve remainder.

4,518,153

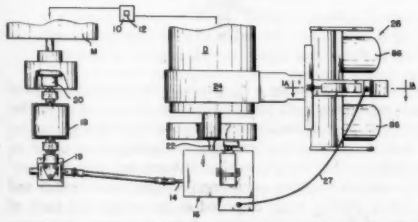
SAFETY MECHANISM FOR HOISTING DRUMS

Harold H. West, King County; Roger A. Johnson, Snohomish County, and Charles W. Clark, Jr., King County, all of Wash., assignors to Ederer Incorporated, Seattle, Wash.

Continuation of Ser. No. 317,054, Nov. 2, 1981, abandoned. This application Jun. 27, 1984, Ser. No. 624,918

Int. Cl.³ B66D *1/48, 1/54, 5/20*

U.S. Cl. 254—274 **27 Claims**



1. A safety system in a hoist having a motor with a motor shaft, a power transmission main drive, said system having an error between the relative rotations of the drum and the motor shaft, a drum, and a safety brake drivingly coupled on an operating element operatively connected to the drum, comprising:

a mechanical out-of-sync detector,

a safety brake actuator responsive to an output from the out-of-sync detector for applying said safety brake,

said detector including a monitoring secondary drive train having a first input shaft drivingly coupled to said motor, a second input shaft drivingly coupled to said drum, means for detecting a predetermined variation in relative speed or direction between said two shafts and producing a unidirectional brake-setting rotational output, and

correction means for producing a predetermined, limited, differential rotational direction and velocity between said first and second input shafts to generate a unidirectional rotational output in a predetermined direction opposite said unidirectional brake-setting rotational output greater than said relative rotation error for compensating for such relative rotation error.

4,518,154

PNEUMATIC SPRING, ESPECIALLY FOR MOTOR VEHICLES

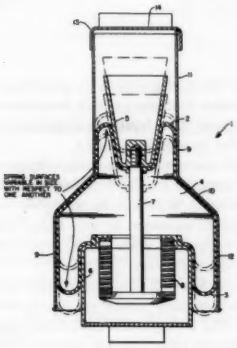
Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,578

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836662

Int. Cl.³ F16F *13/00*

U.S. Cl. 267—34 **15 Claims**



1. A pneumatic spring for motor vehicles which includes at least one closed spring volume, two spring surfaces of different sizes adapted to be subjected to pressure acting in opposite directions, the two spring surfaces each having an effective spring surface which is variable in size as a function of travel of the pneumatic spring, and a separate supporting means for supporting the respective spring surfaces so as to be coaxial with respect to one another, characterized in that means are provided for elastically linking the respective supporting means with one another so as to enable an axial distance between the respective supporting means to be variable within predetermined limits as a function of a pressure of the closed spring volume,

characterized in that a smaller of the two spring surfaces decreases over the travel distance of the pneumatic spring, two roll bellows means provided for forming the respective spring surfaces, said spring surfaces facing away from each other, each of the roll bellows means defining a partial volume of the at least one closed spring volume, the supporting means includes a pair of spring piston means having different diameters associated with the respective roll bellows means such that the effective spring surfaces of the roll bellows means facing away from each other are supported by the respective spring piston means, and in that at least the smaller of the spring piston means includes a support surface means for the roll bellows means which tapers over the travel distance of the pneumatic spring, and in that a spring force is transmitted by the spring piston means and a supporting element associated with walls of the roll bellows means.

4,518,155
FIXING DEVICE OF WORKPIECES FOR WIRE SPARK EROSION MACHINES

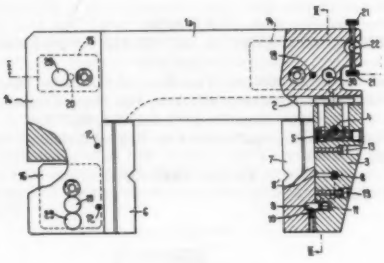
Franz Lehmann, Evilard, Switzerland, assignor to Imea SA, Reconvilier, Switzerland

Filed Jul. 13, 1982, Ser. No. 397,926

Claims priority, application Switzerland, Aug. 11, 1981, 5156/81

Int. Cl.³ B25B *1/02*

U.S. Cl. 269—60 **12 Claims**



1. A device of flat configuration for securing a workpiece on a wire spark erosion machine, which comprises:

an L-shaped base plate having a long leg and a short leg perpendicular to said long leg;

first jaw means mounted to said short leg;

slider means mounted to said long leg for sliding movement toward and away from said short leg;

second jaw means mounted to said slider means and being adapted to cooperate with said first jaw means to grip a workpiece therebetween;

fastening means for securing the device to a wire spark erosion machine, said fastening means being adjustably attached to said base plate so as to allow limited displacement of said base plate toward and away from said fastening means;

adjusting means for positioning said base plate relative to said fastening means for orienting a workpiece gripped between said first and second jaw means with respect to the direction of the working position of the wire on the machine;

said base plate being supported at three supporting points being located at the intersection of a longitudinal axis of said short leg and a longitudinal axis of said long leg, and the other two supporting points being located respectively at the extremities of said short leg and said long leg of said base plate.

4,518,156
METHOD FOR CONVEYING FOLDED SHEETS

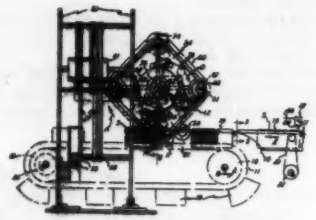
James R. Moser, Easton, Pa., assignor to Stobb, Inc., Clinton, N.J.

Division of Ser. No. 421,157, Sep. 22, 1982, Pat. No. 4,482,141. This application Jun. 11, 1984, Ser. No. 619,545

Int. Cl.³ B65H *39/02*

U.S. Cl. 270—54 **7 Claims**

1. A method of transporting folded sheets from a raceway to a conveyor, comprising the steps of initially draping the folded sheets over a first section of the raceway which supports the sheets at a first folded angle and with the fold of the sheets being at the top of the sheets, moving the folded sheets along the raceway and transferring the folded sheets to a second section of the raceway at a folded angle less than the first folded angle, the folded sheets being supported on the raceway to have one end of the sheets along the fold free of any support, and then gripping the folded sheets at the fold where the sheets are free of support, and lifting the sheets upwardly off the



raceway and depositing the folded sheets onto a horizontally moving conveyor.

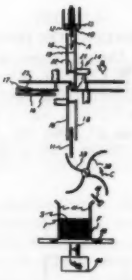
4,518,157
METHOD FOR TRIMMING A SIGNATURE HELD IN A ROTARY CLAMP

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Division of Ser. No. 533,302, Sep. 19, 1983, Pat. No. 4,496,140. This application Aug. 31, 1984, Ser. No. 645,867

Int. Cl.³ B65H *39/02*

U.S. Cl. 270—58 **4 Claims**



1. A method of handling a signature, comprising the steps of moving a signature, with planar disposed sheets, into a holder and having an edge of the signature extend beyond the confines of the holder, rotating the holder with the signature about an axis extending along the plane of said sheets and past a stationary cutter which has been positioned adjacent said holder and which has a cutting edge disposed in the rotational path of movement of the extending edge of the signature, and trimming the extending edge of the signature off the signature while the signature is continuously rotated past said cutting edge.

4,518,158
GUIDE FOR USE IN A BANK NOTE HANDLING MACHINE

Kowichi Goi, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,948

Claims priority, application Japan, Dec. 27, 1980, 55-191596[U]

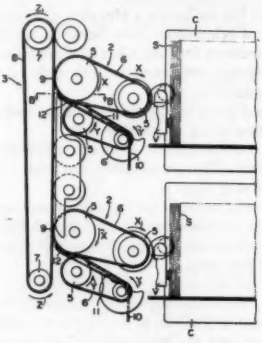
Int. Cl.³ B65H *5/08*

U.S. Cl. 271—9 **3 Claims**

2. In a bank note handling machine having a delivery mechanism comprising a plurality of first paths, having first conveyor means for conveying the bank note in a first direction a second path having second conveyor means for conveying the bank

note in a second direction, said second direction being different than the first direction and a plurality of guides provided at the junction of one of the first paths and second path and means for feeding a bank note from a bin into the first path, the improvement comprising:

a comb-like guide mechanism stationarily disposed relative to said first and second conveyor means while guiding bank notes therebetween for supporting the bank note from underneath and delivering the leading edge of the bank note to the second path from the first path without damaging the leading edge of the bank note as it contacts the second path by causing the bank note to smoothly curve from the first direction to the second direction, the guide mechanism having an upper portion curved upwardly and throughout the entire width of the leading edge of the bank note as it is supported thereby and a plurality of depending members integral with the curved



portion, said depending members being located closely adjacent said first conveyor means to guide the bank notes to the upper curved portion of the guide, said upper curved portion of the guide being located closely adjacent said first and second conveyor means to transfer the bank note along from said first conveyor means to said second conveyor means, a notch being provided between said depending members to allow for rollers and belts of said first path to project therethrough, said notch of said guide terminating at said upper curved portion closely adjacent the projecting rollers and belts of said first conveyor means whereby the bank note is smoothly guided along the guide and whereby the bank note is maintained in a non-corrugating dispostion along its width which is normal to the direction in which it is fed so that damage to the bank note is avoided due to the bank note striking against the second conveyor.

4,518,159

SHEET PAPER ATTRACTING SYSTEM

Toshiki Nishibori; Sumio Kita, both of Nara, and Sakuharu Takano, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1983, Ser. No. 468,958

Claims priority, application Japan, Mar. 1, 1982, 57-32633

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—103 **3 Claims**

1. A paper sheet supplying system comprising:

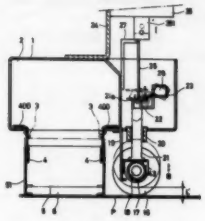
a paper sheet holder for supporting paper sheets stacked thereon;

a paper sheet attracting unit having a first major wall provided with a plurality of air intake openings, said first major wall confronting said paper sheets supported by said paper sheet holder;

suction means for creating an attracting suction force through said air intake openings;

a pressure roller for depressing said paper sheets supported by said paper sheet holder by a predetermined pressure;

a paper sheet feeding member for transferring a paper sheet attracted by said paper sheet attracting unit; and



drive means for separating said pressure roller from said paper sheets when said paper sheet feeding member transfers a paper sheet.

4,518,160

FLAT ARTICLE STACKING AND TRAY LOADING APPARATUS

Eric G. Y. Lambrechts, Antwerp; Herman K. M. Verhoeven, St. Niklaas, and Constant J. P. Claes, Deurne, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

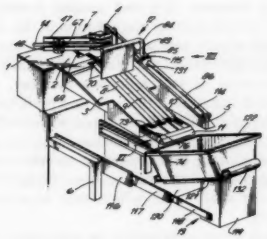
Continuation of Ser. No. 209,236, Nov. 21, 1980, abandoned.

This application May 23, 1983, Ser. No. 496,335

Claims priority, application European Pat. Off., Oct. 15, 1980, 80200974.6

Int. Cl.³ B65H *29/16, 31/06*

U.S. Cl. 271—214 **4 Claims**



1. Tray loading apparatus comprising:

stack supporting means for a stack of flat articles, said stack supporting means including a stationary support surface and a movable support surface extending beyond the front end of said stationary support surface;

spring means for urging said movable support surface away from said stationary support surface;

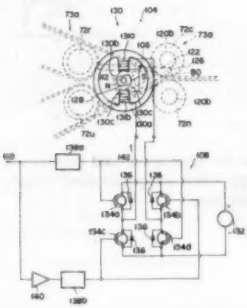
a removable stacking plate member for retaining the front of said stack, said plate member being pivotally carried by a holder slidably mounted on an inclined rod mounted along said stationary support; and

tray supporting means adjacent said movable support surface, said tray supporting means being movable toward and away from said movable support surface whereby the front wall of a tray can be brought into abutment with the front end of the stack after said stacking plate is removed so that said stack can be transferred into said tray.

4,518,161
SHEET SORTING APPARATUS

Kunihiko Nakamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 452,925
Claims priority, application Japan, Jan. 22, 1982, 57-7519; Apr. 8, 1982, 57-57245
Int. Cl.³ B65H *29/60*
U.S. Cl. 271—303 **13 Claims**



1. A sheet sorting apparatus comprising:

a delivery device for delivering sheets one after another;

first and second main belts separated at an angle from each other after running through a main superposed section in which said belts hold and carry the delivered sheets, and defining a triangular space therebetween adjoining said main superposed section;

first and second auxiliary belts superposed on part of said main belts to form first and second auxiliary superposed sections, respectively;

pulley means for guiding all said belts, said pulley means including a plurality of space-shape determining pulleys to determine the shape of said space;

a separator member rockably supported in said space and rocking between first and second positions through a predetermined sorting angle to guide the sheets fed from said main superposed section into said space to one of said auxiliary superposed sections corresponding to the rocking direction of said separator member, said separator member being rocked through said predetermined sorting angle when at least one projected portion of said separator member engages said space-shape determining pulleys;

means for rocking said separator member, said means for rocking comprising a rotary actuator including:

(a) a rotary shaft upon which said separator member is mounted,

(b) a rotary member mounted on said rotary shaft for rotation with said separator member, whereby said rotary member can rotate through said predetermined sorting angle,

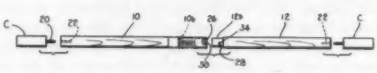
(c) a drive section positioned for acting upon said rotary member said drive section and said rotary member including means for positively retaining said separator member in each of said first and second positions without contact between said rotary member and said drive section, said drive section including means for inducing selective rotation of said rotary member through a rotation angle in two opposite directional senses without contact between said rotary member and said drive section, said rotating angle being greater than said predetermined sorting angle, whereby rotation of said separator member is limited at two positions defined by said separator member engaging said space shape determining pulleys, and whereby said drive section continues to induce selective rotation of said rotary member at each of said two positions; and

first and second collectors receiving and holding therein the sheets delivered from said first and second auxiliary superposed sections.

4,518,162
WEIGHTED EXERCISE BAR

William J. Oates, 101 E. C Ave., Easley, S.C. 29640

Filed Sep. 30, 1982, Ser. No. 432,016
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—93 **2 Claims**



1. An exercise bar device for use in twisting exercises about the exerciser's waist comprising:

an elongated bar including a plurality of elongated sections joined by a releaseable joint between adjoining ends of adjacent sections forming a bar of a predetermined length defined by the outermost remote ends of said sections joined together;

said elongated bar being generally straight and uniform in its cross-section along its entire length;

a generally solid weighted member carried at each of said ends extending longitudinally therefrom within the periphery of said bar;

each said weight member having a cross-section corresponding to the cross-section of said bar defining weighted uniform extensions of about two and one-half pounds thereof at said ends;

said elongated bar having a sufficient length so that said weighted extensions extend past the hands of an exerciser when gripping the bar in an exercise position with the arms spread and the bar supported on the shoulders for twist exercising;

a quick release connection joining said sections together at said joint enabling said device to be broken down into sections for storage and transportation; and

said length of said elongated bar having a ratio to the total length of said weight members of approximately five to one so that an exercise bar is provided having effective accelerating torque for exercise yet may be grasped by outreached hands without reaching the weights and whose total length is not unweildly facilitating use in an interior room space and the like.

4,518,163
EXERCISER WITH ELECTRICALLY CONTROLLED RESISTANCE

Frank J. Bruder, Newport Beach, Calif., assignor to Arthur C. Bentley, Rossmore, Calif.

Continuation of Ser. No. 198,795, Oct. 20, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 423,560
Int. Cl.³ A63B *21/24*
U.S. Cl. 272—132 **6 Claims**

1. An exercise apparatus comprising:

a bench;

a holder bar rotatably mounted on said bench, and positioned for manipulation by the body of an operator;

a brake mechanically connected between said bench and said holder bar for providing resistance force to movement of said holder bar, said resistance force being electrically controllable in response to a braking signal;

an electrical control electrically connected to supply said braking signal to said brake, and to thereby control the braking force provided by said brake, wherein said electrical control comprises:

a power supply providing an electrical power output signal;

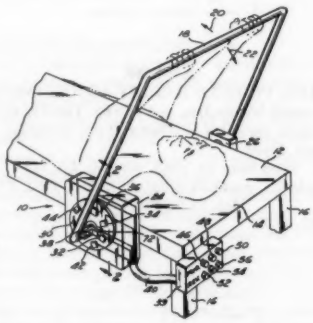
a rotational transducer mounted between said holder bar and said bench for sensing the angular orientation of

said holder bar with respect to said bench, and for producing an electrical orientation signal indicative of said angular orientation;

force programming means electrically connected to said power supply, said rotational transducer means, and said brake, for controlling the transfer of said electrical power output signal to said brake to control said braking force, said force programming means being adjustable to independently control the magnitude of said braking force at each of a plurality of said angular orientations;

a first electrical contact mounted on said bench and positioned to be activated as said holder bar is rotated in a first direction;

a second electrical contact mounted on said bench and positioned to be activated as said holder bar is rotated in a second direction, said first and second electrical contacts defining an operating angle range in the rotation of said holder bar with respect to said bench; and



a relay electrically connected to said first electrical contact, said second electrical contact, said brake, and said plurality of resistors, for providing a first direction state in response to said first electrical contact, and a second direction state in response to said second electrical contact, and for electrically connecting a first set of said resistors to said brake in said first direction state, and electrically connecting a second set of said resistors to said brake in said second direction state;

wherein said rotational transducer comprises an electrical commutator switch assembly comprising:

a plate having a plurality of electrically conductive sector pads mounted along a circular path thereon, said sector pads defining angular ranges in the rotation of said holder bar with respect to said bench; and

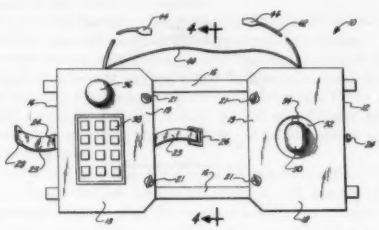
a wiper rotatably mounted on said plate and having an electrically conductive wiper pad, said wiper pad making electrical sequential contact with each of said sector pads as said holder bar is rotated with respect to said bench.

4,518,164
VIDEO GAME CONTROL CONSOLE
Robert L. Hayford, Jr., 500 Mosser Dr., Lafayette, La. 70508
Filed Nov. 10, 1983, Ser. No. 550,372
Int. Cl.³ A63B *71/00*
U.S. Cl. 273—148 B **10 Claims**

1. A game control console for video game controls comprising:

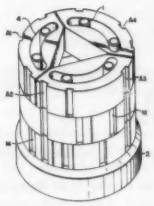
(a) a support frame;

(b) first and second spaced apart control containers adjustably mounted upon the frame so that the space between the containers can be varied, so that the relative position of the first and second control containers can be adjusted



to the lap size of individual players, each container carrying one or more control components.

4,518,165
THREE DIMENSIONAL COMBINATION ASSEMBLY GAME
Shmuel S. Shmueli, 375 Queens Ct., Ridgewood, N.J. 07450
Filed May 11, 1983, Ser. No. 493,585
Int. Cl.³ A63F *9/12*
U.S. Cl. 273—156 **10 Claims**



1. A Three Dimentional Combination Assembly Game comprising:

A. A cylindrical base,

B. Six pins equally spaced on a D diameter which are part of said base,

C. Segments which have radiused slots on a D diameter,

D. One or more grooves on the outside surfaces of said segments.

4,518,166
PLAYING COURT AND METHOD OF USE
Millard C. Trott, 6637 Seminole, West Chester, Ohio 45069
Filed Jan. 7, 1983, Ser. No. 456,450
Int. Cl.³ A63B *71/04*
U.S. Cl. 273—411 **6 Claims**

1. A playing court to be used by bouncing a ball off service walls of said court comprising

a truncated pentagonal dodecahedron said dodecahedron having:

a first service wall;

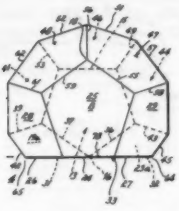
a second service wall;

a floor;

a plurality of side walls said walls and said floor connected together to form a polyhedral playing surface;

wherein said first service wall and said second service wall are parallel to each other and perpendicular to said floor;

said first service wall comprising a pentagon having a lower vertex said lower vertex contacting said floor; and



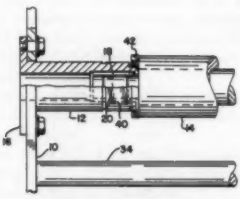
said second service wall comprising a pentagon having a bottom edge said bottom edge adjoining said floor.

4,518,167

SEALING MEANS

Wolodymyr Dutko, Niles, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Jun. 8, 1983, Ser. No. 502,156
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—81 R **19 Claims**



1. In an apparatus of the type handling liquid and including an assembly having a roller and associated metering means, and mounting means for rotatably supporting said roller at its ends and for supporting said metering means, the improvement in sealing means for sealing against leakage of liquid in the regions of said roller ends, said sealing means including compressible, annular seals mounted at each end of said roller, respective mating means defined by said mounting means and said seals for holding the seals against rotation relative to the mounting means, side walls defined by said metering means, and wherein said seals are compressed between said side walls and the roller ends when the metering means is supported in the apparatus, and whereby said sealing is accomplished in said regions where the respective roller ends are rotating while engaged with the respective stationary annular seals.

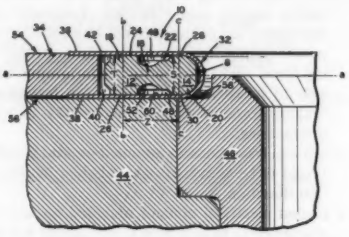
4,518,168

MULTI-THICKNESS FIRE RING ASSEMBLY

Jerome G. Belter, Mt. Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 2, 1984, Ser. No. 585,803
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—235 B **7 Claims**

1. In a fire ring assembly comprising a unitary fire ring having a plurality of concentrically positioned body portions, each portion integrally joined to a radially adjacent body portion by a radially extending bridge, each body portion comprising a pair of axially aligned, parallel load-bearing surfaces, one of said body portions accommodating a greater compression load per unit of axial distortion than an adjacent body portion; an improvement comprising said bridge defining an axially stepped annulus having a greater thickness immediately adjacent the body portion disposed for accommodating said greater compression load.

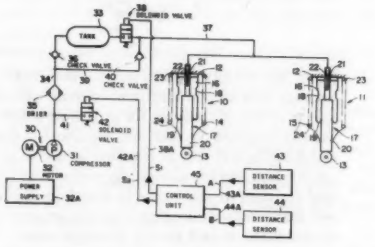


4,518,169

AUTOMATIC VEHICLE HEIGHT-ADJUSTING SYSTEM

Junsuke Kuroki; Namio Irie, and Haruto Tanaka, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 18, 1983, Ser. No. 476,519
Claims priority, application Japan, Apr. 6, 1982, 57-56097
Int. Cl.³ B60G *17/00*
U.S. Cl. 280—6 R **5 Claims**



1. An automatic vehicle height-adjusting system for a vehicle including a sprung mass and an unsprung mass in contact with a road surface, the sprung mass being supported on the unsprung mass via a spring or the like, the system comprising:

(a) means for sensing a distance between the sprung mass and the road surface at a point spaced transversely from the path of a wheel on the vehicle and generating a distance signal indicative thereof;

(b) means responsive to the distance signal for determining whether or not the distance is less than a first predetermined value and for generating a first comparison signal indicative thereof;

(c) means responsive to the distance signal for determining whether or not the distance is greater than a second predetermined value and for generating a second comparison signal indicative thereof, the second predetermined value being greater than the first predetermined value;

(d) means responsive to the first and second comparison signals for increasing the height of the sprung mass with respect to the unsprung mass when the distance is less than the first predetermined value and for decreasing the height of the sprung mass with respect to the unsprung mass when the distance is greater than the second predetermined value.

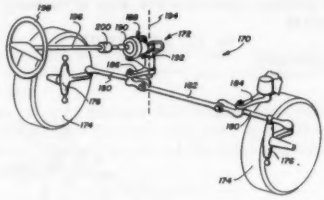
4,518,170
VEHICULAR STEERING APPARATUS EMPLOYING AN ECCENTRIC ACTUATOR

Robert G. Musgrove, Arlington, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Division of Ser. No. 92,970, Nov. 9, 1979, Pat. No. 4,286,761, which is a continuation-in-part of Ser. No. 933,697, Aug. 15, 1978, abandoned. This application Jul. 10, 1981, Ser. No. 282,345

Int. Cl.³ B62D *5/06*

U.S. Cl. 280—96 **16 Claims**



6. A vehicle steering system comprising:

a pair of wheels mounted in mutually spaced relationship for pivotal movement, about generally vertical axes, the steering means comprising:

linkage means operatively connected to the wheels,

an actuator connected to the linkage means for effecting movement of the linkage means, and pivotal movement of the wheels, the actuator comprising:

first and second structures, one of the structures being drivingly connected to the linkage means,

an elongate beam with first and second portions having first and second longitudinal axes, respectively, said axes intersecting at the pivot axis and being mutually skewed at a predetermined skew angle,

housing means attached to the second structure for rotation about the second axis and for eccentric revolution about a circle with a centerline intersecting the pivot axis, and

means for effecting rotation of the housing means about the second axis and for effecting eccentric revolution of the second beam portion in an opposite direction such that the first beam portion pivots about the pivot axis to cause relative pivotal movement between the structures.

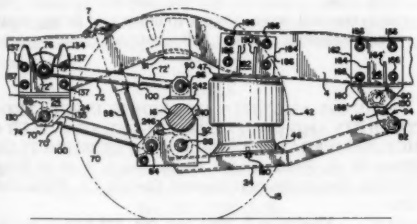
4,518,171
AIR SUSPENSION SYSTEM

William E. Hedenberg, 490 Buffalo Grove R., Buffalo Grove, Ill. 60090

Filed Oct. 14, 1983, Ser. No. 541,710

Int. Cl.³ B60G *11/26*

U.S. Cl. 280—711 **20 Claims**



1. In a wheel supported vehicle having a frame, a generally non-rotatable rear axle means in the form of a dead axle or a housing for a live axle, and axle air suspension units, each said unit disposed to provide support for said vehicle from opposite ends of said axle means, the improvement wherein each said suspension unit comprises:

axle carrier means fixedly attached to said axle means proximate to the outer end thereof;

a torque arm hanger means attached to the frame of said vehicle generally ahead of said axle carrier means;

an upper torque arm having a first end and a second end;

a lower torque arm having a first end and a second end;

first pivoting means for pivotally attaching said first end of said upper torque arm to said torque arm hanger means, said first pivoting means being rotatable about a first pivoting axis;

second pivoting means for pivotally attaching a first end of said lower torque arm to said torque rod hanger means generally below said first end of said upper torque arm, said second pivoting means being rotatable about second pivoting axis, the pivoting axes of said first and second pivot means being disposed generally parallel to the axis of said axle means to as to allow the second or rear ends of said torque arms to move in generally parallel vertical directions;

third pivoting means rotatable about a third pivoting axis for pivotally attaching said rear end of said upper torque arm to said axle carrier means at a point generally above said axle axis;

fourth pivoting means rotatable about a fourth pivoting axis for attaching said second end of said lower torque arm to said axle carrier means at a point generally below said axle means axis, said third and fourth pivoting means having their pivoting axes generally parallel to said axle means axis, the locations of said first, second, third, and fourth pivoting means being chosen such that said torque arms are disposed rearwardly to diverge from one another to extend towards opposite sides of the axis of said axle means;

trailing arm having a forward end and a rearward end;

fifth pivoting means for pivotally attaching said forward end of said trailing arm to a point on said axle carrier means generally below said axle axis;

a link member having a first end and a second end;

sixth pivoting means for pivotally attaching said rearward end of said trailing arm to a first end of said link;

seventh pivoting means for pivotally attaching the second end of said link to a portion of said frame located to the rear of said axle means; and

air spring means including at least one air spring interposably mounted between said frame and said trailing arm in a region generally between said axle means and said sixth pivoting means so as to transmit substantially the entire load between said vehicle and said axle means, said air spring means including automatic air spring extension controlling means for maintaining said torque rods at a chosen disposition under varying vehicle loading conditions, said fifth, sixth, and seventh pivoting means having their pivoting axes generally parallel to said axle axis.

4,518,172
ENERGY-DISSIPATINGLY FLEXIBLE KNEE-RESTRAINING ELEMENT

Botho Bortz, Wolfsburg, and Erwin Wulfes, Gifhorn, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,704

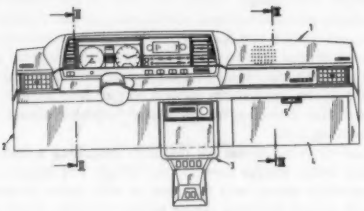
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150964

Int. Cl.³ B60R *21/04*

U.S. Cl. 280—751 **5 Claims**

1. An energy-dissipating knee-restraining element for a vehicle having an instrument panel comprising a hollow profiled beam extending in the transverse direction of said vehilce, means forming a cut-out in said hollow profiled beam below the instrument panel approximately at the level of the knees of a passenger seated on the passenger side of the vehicle, rigid

frame means surrounding said cut-out, the rigid frame means surrounding the cut-out comprising an inner plate and an outer plate, defining together a rigid hollow construction at edges of



the cut-out in the hollow profiled beam, a pivoting flap means normally covering the cut-out fashioned as an energy-dissipating hollow profiled element, and a storage compartment means rigidly affixed to the pivoting flap means.

4,518,173

RING JOINT FOR SEATBELT SYSTEM

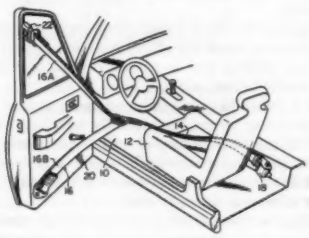
Makoto Yamada, Toyota; Tatsushi Kubota, Okazaki, and Ikuzo Kojima, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Takai-Pika-Denki-Seisakusho, both of Tokyo, Japan

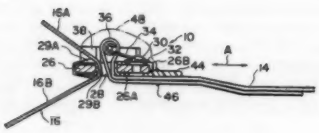
Filed Jul. 15, 1982, Ser. No. 398,566

Claims priority, application Japan, Jul. 31, 1981, 56-115219[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **12 Claims**





1. A ring joint for use in a seatbelt system for protecting an occupant in an emergency situation of a vehicle, the seatbelt system including an outer webbing connected to an inner webbing through said ring joint, said ring joint comprising:

a joint base of a plate type around which is wound the intermediate portion of the outer webbing;

a lock member supported by said joint base and engaged with the inner webbing for locking a contact portion of said outer webbing between said joint base and said lock member in an emergency situation of the vehicle; and

stoppers projecting from said joint base for restricting the movement of said lock member in the widthwise direction of the inner and outer webbings; whereby, when locking is effected between said joint base and said lock member, said webbing and said lock member are prevented from moving relative to each other, said lock member is locked against dislodging from said joint base, and the occupant is maintained in a reliably restrained state.

4,518,174

APPARATUS FOR ADJUSTING THE HEIGHT OF THE FIXING OR GUIDE FITTING FOR THE SHOULDER BELT OF A SAFETY BELT SYSTEM

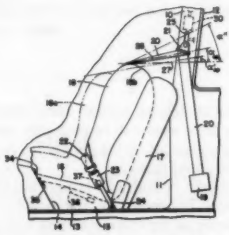
Gerhard Sedlmayr, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH, Relligen, Fed. Rep. of Germany

Filed Nov. 26, 1982, Ser. No. 444,698

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146918

Int. Cl.³ A62B *35/02*

U.S. Cl. 280—808 **24 Claims**



1. An apparatus for adjusting the height of the upper fixing or guide fitting for the shoulder strap of a safety belt system, said apparatus including means for adapting the vertical position of said fixing or guide fitting to the sitting position of the person which is to wear the safety belt; the improvement comprising:

a sensing apparatus associated with said fitting for sensing said shoulder strap in terms of at least one parameter of its operative connection to the person which is strapped, and for triggering a reaction, from said adapting means, to the situation ascertained;

said sensing apparatus having a sensing arm for sensing the direction of travel which said shoulder strap takes between said fitting and the person;

said sensing arm having a first end connected to said fitting, and a second free end which is connected to said shoulder strap;

said sensing apparatus having an angle measuring device for determining the angular position of said sensing arm relative to a reference line, and a servo element as said means for adapting the vertical position of said fitting; and

said servo element being activated to move said fitting until a given angular position of said sensing arm relative to said reference line is obtained, the angle measured by said device for determining the angular position of said sensing arm being converted into an electrical impulse which activates said servo element to move said fitting continuously adjusting shoulder belt location.

4,518,175

TUBULAR ASSEMBLY INCLUDING INSULATED CONDUITS AND COUPLERS FOR THE TRANSFER OF HIGH TEMPERATURE AND HIGH PRESSURE FLUIDS

William D. C. Richards, and Harry Straub, both of King of Prussia, Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed May 7, 1982, Ser. No. 375,839

Int. Cl.³ F16L *59/14*

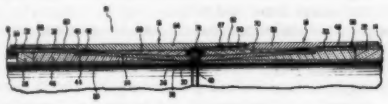
U.S. Cl. 285—47 **7 Claims**

1. A pipe assembly comprising:

a first conduit having an inner pipe for conveying fluids and an outer pipe surrounding the inner pipe and defining an

annular cavity therebetween, said outer pipe having threaded ends and said inner pipe having its ends extending outwardly well beyond said outer pipe threaded ends;

frusto-conical members joining corresponding ends of said inner and outer pipes for sealing the cavity and supporting said pipes in spacial relationship;



a male coupling having a first threaded end sized to engage one threaded end of the outer pipe, and a second threaded end; and

a female coupling having a first threaded end sized to engage the other end of the outer pipe and a second threaded end sized to engage the second threaded end of said male coupling.

4,518,176

VEHICLE WITH ECCENTRICALLY MOUNTED WHEELS

Károly Hegedüs, Budapest, Hungary, assignor to Aranykalasz Mgtsz, Rackeve, Hungary

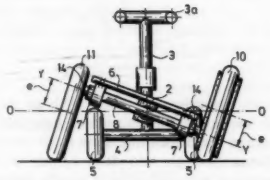
PCT No. PCT/HU81/00046, § 371 Date Aug. 16, 1982, § 102(e) Date Aug. 16, 1982, PCT Pub. No. WO82/02027, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 16, 1981, Ser. No. 413,354

Claims priority, application Hungary, Dec. 16, 1980, 2999/80

Int. Cl.³ B62M *1/18*

U.S. Cl. 280—229 **9 Claims**



1. A vehicle comprising a chassis having a forward section, and a rear section connected to said forward section said rear section having a platform mounted for tilting movement about a horizontal axis, a freely rotatable shaft suspended from said platform and having a wheel attached thereto at each end, the centers of each wheel being eccentric by a predetermined distance from the axis of said shaft in radially opposite directions, the axis of said shaft extending at an acute angle to the line connecting the center of each wheel, one of said wheels being fixed to said shaft to rotate conjointly with said shaft, said other wheel being freely rotatable about the center of said wheel.

4,518,177

HUBLESS PIPE COUPLING

Thomas A. Deakins, Star Rte., Sequatchie, Tenn. 37374

Continuation-in-part of Ser. No. 326,106, Nov. 30, 1981,. This application May 9, 1984, Ser. No. 607,730

Int. Cl.³ F16L *3/00*

U.S. Cl. 285—64 **7 Claims**

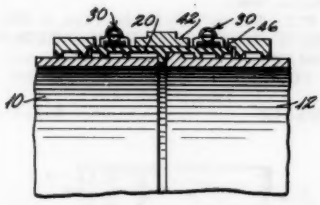
1. In a coupling for axial coupling of cast iron hubless pipes and fittings having barrels with substantially smooth circumferential surfaces near the ends thereof, said coupling comprising a compressible sleeve for receiving two of said ends to be coupled and means for constricting said sleeve about and into sealing engagement with said circumferential surfaces, the improvement comprising:

separate housing means for substantially enclosing said sleeve and increasing the resistance of said coupling to internal fluid pressure of a pipe run, said housing means comprising:

at least two portions connectable together to substantially surround and conform to said circumferential surfaces;

aperture means in at least one of said portions for providing access to said constricting means;

means for tightening said connected portions about said barrels;



means for biting into said circumferential surfaces during said tightening to limit relative axial movement between said barrels; and

means for preventing leaks, and comprising bevels on inner surfaces of said portions, said bevels running substantially an axial length of said compressible sleeve such that mounting of said portions about said sleeve and consequent pinching of said sleeve by said portions to cause leaks in said coupling is obviated by said bevels and said biting means.

4,518,178

LOCKING DEVICE

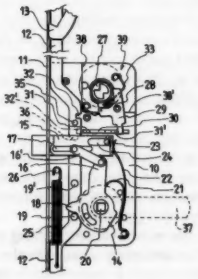
Sigurd W. Bengtsson, Gothenburg, Sweden, assignor to AB Fixfabriken, Gothenburg, Sweden

Filed Apr. 29, 1983, Ser. No. 489,776

Claims priority, application Sweden, Apr. 29, 1982, 8202702

Int. Cl.³ E05C *9/04*; E05B *9/08*

U.S. Cl. 292—8 **7 Claims**



1. A building-closure operator for being installed on the edge of the closure for holding the closure in a closed position, comprising:

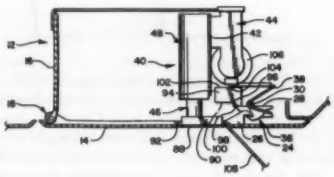
(a) an espagnolette edge bar adapted to be secured to the closure's edge;

(b) a casing secured to said edge bar and receivable in a recess in the closure, said casing having an open space of predetermined dimension;

(c) at least one bolt disposed remotely from said casing, and supported for movement through said edge bar to a locking position, and to a retracted position:

(d) an espagnolette rod operatively connected to said bolt for maneuvering it;
(e) handle-controlled operating means in said casing for reciprocating said rod; and
(f) means for latching and locking said bolt, at least the lock part thereof being an insert of said predetermined dimension and directly insertable and disposed in said space and secured to said casing.

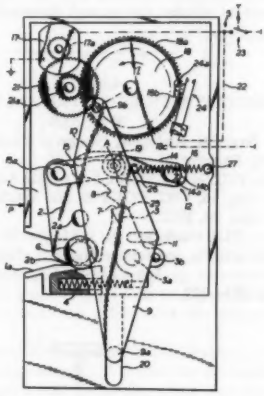
4,518,179
TEST STOP ASSEMBLY FOR OXYGEN BOX DOOR
James A. Fenner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
PCT No. PCT/US82/01719, § 371 Date Dec. 9, 1982, § 102(e) Date Dec. 9, 1982, PCT Pub. No. WO84/02279, PCT Pub. Date Jun. 21, 1984
PCT Filed Dec. 9, 1982, Ser. No. 474,653
Int. Cl.³ E05C *3/08*
U.S. Cl. 292—166 **9 Claims**



1. A test stop assembly particularly adapted to be used with an oxygen box door and an actuable latching mechanism having actuating means for the door, said assembly comprising:
a. mounting means for mounting the assembly proximate the actuating means of the latching mechanism;
b. a stem means mounted in the mounting means for reciprocating movement along an axis of travel, said stem means having three positions along said axis, namely:
1. a first normal intermediate position;
2. a second extended test position;
3. a third retracted reset position;
c. biasing means operatively engaging the stem means to urge the stem means from the second and third positions to the first intermediate position;
d. said stem means comprising an end stop means positioned at an end portion of the stem means, said stop means being shaped to fit in a mating aperture in the door when the stem means is in the first intermediate position so as to permit movement of the stem means inwardly from the door to the third retracted reset position, said stop means being arranged to be rotatable out of alignment with said aperture when the stem means is in the second extended test position, so that said stop means can be located in a door stopping position;
e. said stem means having a reset portion positioned to engage the actuating means for the latching assembly when the stem means is moved to its third reset position.

4,518,180
AUTOMOBILE POWER DOOR LATCH
Frank Kleefeldt, Heiligenhaus, and Rolf Raetz, Essen, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany
Filed Sep. 15, 1982, Ser. No. 418,584
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150620; Dec. 21, 1981, 3150621
Int. Cl.³ E05C *3/06*
U.S. Cl. 292—201 **9 Claims**

1. A door-latching mechanism for a vehicle door adapted to cooperate with a pin of a doorpost, said mechanism comprising:
a housing mounted on the door;
a bolt rotatably mounted on said housing and having a fork engageable with said pin, said bolt being rotatable from a locking position wherein said pin is retained against escape from said bolt into an open position wherein said pin can escape from said bolt;
a pawl pivotally mounted on said housing and engageable with said bolt to limit displacement thereof into said open position;
a toggle linkage including a pair of articulated levers connected to said bolt and to said housing, said toggle linkage being shiftable between operative positions on opposite sides of a dead center position for rotating said bolt and having a spring connected between said linkage and said housing for biasing said linkage at least into one of said operative positions;



a slider on said housing provided with at least a pair of abutments including on abutment engageable with said toggle linkage for displacing same from one of its operative positions through said dead center position to the other operative position of said toggle linkage, and another abutment engageable with said pawl for releasing same from its bolt said spring biasing said toggle linkage against said one abutment in said one operative position; and
an electric motor driven crank connected to said slider and energizable to displace said slider and shift said one abutment to thereby displace said toggle linkage and rotate said bolt, said crank being so connected to said slider that, upon displacement of said toggle linkage into said other operative position and release of said pawl from said bolt, said spring is effective to rotate said bolt through said linkage to release said pin.

4,518,181
LOCKING DEVICE
Shinjiro Yamada, Tokyo, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 24, 1983, Ser. No. 497,711
Claims priority, application Japan, May 28, 1982, 57-90955; Dec. 14, 1982, 57-218739
Int. Cl.³ E05C *3/26*
U.S. Cl. 292—201 **11 Claims**

1. A locking device of the type comprising: latch means; a lock member movable between a locking position, in which said locking device is caused to assume a locking condition to prevent the latch means from being released, and an unlocking position, in which said locking device is caused to assume an

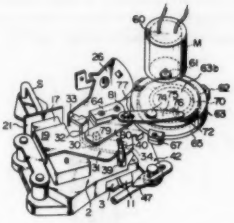
unlocking condition allowing the latch means to be released; and a powered operating means for causing said locking member to move between said locking position and said unlocking position; said powered operating means comprising:

a rotary member coupled to driving means so as to be rotated in either direction, said rotary member having on the surface thereof a cam groove which extends around the axis of rotation of the rotary member and has a first end and a second end which are spaced apart from each other by a suitable distance in at least one of the radial and axial directions of the rotary member, said rotary member also having a connecting cam groove interconnecting said first end and second end of said cam groove;

a cam follower slidably engaged with said cam groove of the rotary member, rotation of the rotary member by the driving means causing the cam follower to be shifted by said suitable distance; and

means for operatively connecting the cam follower to said lock member in such a manner that when the cam follower is at said first end of the cam groove the lock member takes the locking position, and when the cam follower is at said second end of the cam groove the lock member takes the unlocking position;

the lock member being movable manually between the locking and unlocking positions, said connecting cam groove allowing the cam follower to move directly between said first and second ends of the cam groove when the lock member is caused to move manually between the locking and unlocking positions.



4,518,182

ELECTRIC SAFETY LOCK MORE SPECIALLY FOR MOTOR VEHICLE DOORS

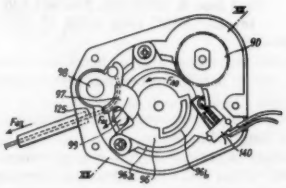
Maurice Cousin, Flers; Yves Pipon; Georges Droulon, both of St.-Georges-des-Groseillers, and Jean Lebrun, La Lande/-Patry Flers, all of France, assignors to A & M Cousin Etablissements Cousin Freres S.a.r.l., Flers, France

Filed Jul. 14, 1983, Ser. No. 513,413

Claims priority, application France, Jul. 19, 1982, 82 12545; Jul. 8, 1983, 83 11436

Int. Cl.³ E05C *13/10*

U.S. Cl. 292—201 **9 Claims**



1. Electric safety locks, more specially designed for motor vehicle doors, in which each of the vehicle doors including the motor bonnet, the petrol tank cap and the luggage boot of the vehicle are equipped with a set consisting of a case (1) in which an electric micro-motor (2) is mounted, and wherein a shaft (3) of the motor drives a pinion (4) cooperating with a reducer which permanently engages with a toothed cam (15) having a protruding part (15*a*) which cooperates with a pushing finger (20) which passes through the case (1) and an anterior wall of a casing (12) so as to control rotation of a ratchet (13) having an end tooth (13*b*) which engages into teeth of a rotating bolt which is mounted in the casing (12) and comprises a cut opening (24) which receives a bar (25) which forms a lock-staple (25) and that supplying of the motor is monitored by a printed circuit which enables, by using switches (40, 41, 42, 43, 44) the door to be open or temporarily closed for protection of occupants of the vehicle.

4,518,183

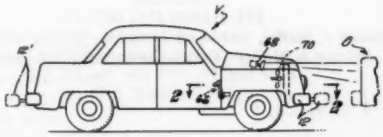
EXTENDIBLE SAFETY IMPACT BAGS FOR VEHICLES

Joseph K. Lee, 10616 Brambiebush Ave., Whittier, Calif. 90604

Filed Feb. 27, 1984, Ser. No. 583,751

Int. Cl.³ B60R *19/10*

U.S. Cl. 293—118 **17 Claims**



1. The method of intercepting an object in the path of a passenger vehicle during impact between said object and passenger vehicle while said vehicle is traveling at a predetermined unsafe impact speed which comprises:

a. Providing a detection means on said moving vehicle that anticipates a possible impending impact with an object in the path of said moving vehicle or an object coming upon said vehicle from behind;

b. Inserting a forwardly or rearwardly extending mechanism within the frame of said vehicle for actuating an extension procedure of the bumpers of said vehicle prior to an impending impact of said vehicle as determind by said detection means;

c. Providing a releasable retaining apparatus for keeping said extending mechanism either from being actuated from an initial retracted condition or for keeping said retaining apparatus in an extended condition when it has been moved into that position while preparing for possible impending impact with another object;

d. Placing a dually compartmented impact shock absorbing air cusioning apparatus at either front or back, or both, of said moving vehicle between said frame of said vehicle and the bumpers of said vehicle;

e. Providing air filling and air extracting means for both compartmented air bags and for controlling the amount of air in the second outwardly placed bag when it is determined that the vehicle is either in or out of danger of possible impact; and

f. providing a retracting mechanism for returning the bumpers of the vehicle to an initial inoperative condition if no impact is detected imminent, or if no impact takes place.

4,518,184

DEVICE FOR REMOTELY PASSING A CORD IN OR AROUND AN ANCHORING MEMBER

Claude Pecorini, 2/11 Rue des Bugnons, CH-1217 Meyrin, Geneva, Switzerland

Filed Nov. 18, 1982, Ser. No. 442,797

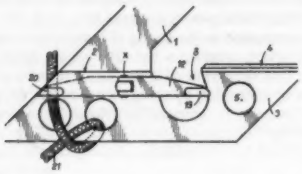
Claims priority, application Switzerland, Nov. 27, 1981, 7584/81; May 10, 1982, 2903/82

Int. Cl.³ B63B *21/04*

U.S. Cl. 294—19.1 **10 Claims**

1. Device for remotely passing a cord in or around an an-

choring member, comprising a support on the end of which a slide is fast as well as a sliding block sliding linearly in said slide; the sliding block having linear sliding surfaces on oppo-



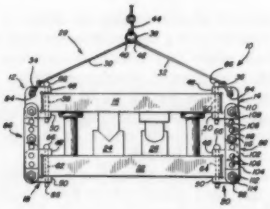
site sides of a notch that opens toward said support; the sliding block having a length greater than twice that of the slide by an amount equal at least to the width of said notch and comprising, at at least one of its ends, fixing means for the cord.

4,518,185

DIE HANDLING DEVICE

Robert J. Shiffer, Smithfield Township, Monroe County, Pa., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 19, 1983, Ser. No. 533,232
Int. Cl.³ B66C *1/16*
U.S. Cl. 294—67.1 **5 Claims**



1. A device for lifting as an assembly a die set of the type having separable upper and lower die shoes disposed in vertically spaced apart relationship comprising:

a first pair of clamps each including means for removably engaging one end of each of said upper and lower die shoes;

a first adjustable in length link connecting said first pair of clamps in vertically spaced apart relationship;

a second pair of clamps each including means for removably engaging an end of each of said upper and lower die shoes opposite to said one end;

a second adjustable in length link connecting said second pair of clamps in vertically spaced apart relationship; and

a sling connected between an uppermost one of said first pair of clamps and an uppermost one of said second pair of clamps.

4,518,186

AUTOMATIC COUPLING DEVICE FOR LOADING PLATFORMS

Gunnar Hörnberg, Ramnäs, Sweden, assignor to Konstruktions Teknik, Upsala, Sweden

PCT No. PCT/SE82/00288, § 371 Date May 23, 1983, § 102(e) Date May 23, 1983, PCT Pub. No. WO83/01059, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 21, 1982, Ser. No. 503,133
Claims priority, application Sweden, Sep. 23, 1981, 81056293
Int. Cl.³ B66C *1/38*
U.S. Cl. 294—82.24 **6 Claims**

1. A coupling apparatus which may be automatically coupled and uncoupled relative to a loading platform for raising and lowering said platform attached to said coupling apparatus comprising:

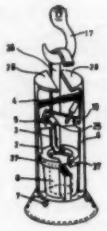
(a) a coupling head having a first end attached to said loading platform and a second end extending from said loading platform;

(b) a casing open at one end and at an opposite other end, said one end being attachable to a hoisting cable;

(c) a pair of opposing legs one end of each of which extends into said one end of said casing for pivotal attachment to said casing;

(d) a jaw extending from each of said legs to form a pair of opposing jaws; and

(e) means attached to said legs for automatically causing said legs to pivot about their pivotal attachment to pull said opposing legs and said opposing jaws towards each other so that said jaws are coupled to said coupling head when said casing is lowered a first time so that said head extends into said other end of said casing, and for automatically



causing said legs to pivot about their pivotal attachment to push said opposing legs and said opposing jaws away from each other so that said jaws are uncoupled from said coupling head when said casing is lowered a subsequent second time and said cable is slackened to an extent to allow said casing to be removed relative to said coupling head said causing means including a lock flap one end of which is pivotally attached to one of said legs of said pair and the other end of which extends towards a lock lug extending from the other of said legs of said pair, said other end of said lock flap engaging said lock lug when said jaws are uncoupled from said coupling head, and push rod means pivotally attached to said lock flap for causing said lock flap to pivotally disengage said lock lug allowing said jaws to be pulled together to couple said jaws to said coupling head when said push rod means engages said coupling head as said head extends into said other end of said casing as said casing is lowered said first time.

4,518,187

PARALLEL MOVEMENT GRIPPER HEAD

Leland F. Blatt, Grosse Pointe Shores, and David J. Crorey, Utica, both of Mich., assignors to Leland F. Blatt, Fraser, Mich.

Filed Jun. 6, 1983, Ser. No. 501,526
Int. Cl.³ B66C *1/42*; B25J *15/04*
U.S. Cl. 294—88 **12 Claims**

1. A parallel movement gripper head comprising of a body including a pair of parallel spaced side plates interconnected at their one ends;

there being a pair of opposed guide slots upon their interiors along a longitudinal axis;

a longitudinally reciprocal rod end spanning and slidably mounted within said slots and adapted for connection to a reciprocal piston rod of a power cylinder adapted for connection to said body;

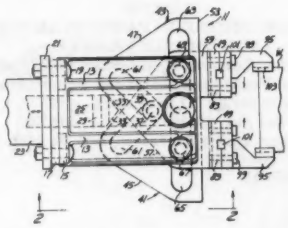
a pair of opposed jaw assemblies interposed between said side plates, guidably mounted upon said body and adapted for simultaneous alternate inward and outward movements in a path at right angles to said axis;

each jaw assembly including a pair of parallel spaced jaw plates nested within said body and at their one ends projecting outwardly thereof;

opposed jaw pads for each jaw assembly respectively, extending transversely of and spanning said one ends of said jaw plates and secured thereto, adapted for operatively securing engagement with a workpiece;

each jaw plate having a cam slot extending at an acute angle to said axis and a pair of aligned guide slots extending at right angles to said axis;

the cam slots of each pair of jaw plates being inclined outwardly upon opposite sides of said longitudinal axis, respectively;



a plurality of roller means mounted upon said rod end on an axis transverse to said longitudinal axis and respectively nested within said cam slots;

and a spaced pair of a plurality of aligned roller means mounted upon and spanning said side plates adjacent their other ends on spaced axes at right angles to said longitudinal axis and respectively nested within said guide slots, whereby movement of said rod end in one direction moves said jaw pads towards each other and movement in the opposite direction moves said jaw pads away from each other.

4,518,188

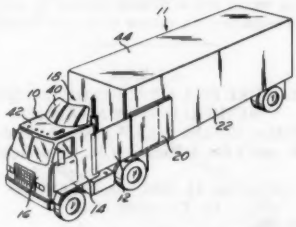
AERODYNAMIC SIDE PANELS FOR A TRACTOR-TRAILER TRUCK

Hans J. Witten, 9201 Half-League Dr., Huntington Beach, Calif. 92646

Filed Jun. 14, 1982, Ser. No. 387,763

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **3 Claims**



1. A device for improving airflow around a tractor-trailer truck comprising:

a pair of side panels on opposite sides of said tractor and trailer for providing a smooth side transition surface between said tractor and trailer;

means for mounting one end of each of said side panels to said tractor; and

guide means mounted on each side of said trailer for restraining different portions of the length of each of said side panels to simultaneously lie in planes parallel to the sides of said trailer as said tractor-trailer truck articulates, said guide means including roller support means for vertically supporting said different portions of each of said side panels.

4,518,189

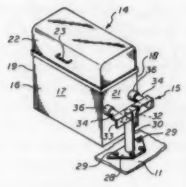
COOKING APPARATUS FOR PICKUP TRUCKS

Robert Belt, 25611 Walnut Grove, Spring, Tex. 77380

Filed Jan. 18, 1983, Ser. No. 458,837

Int. Cl.³ B60R *7/08*

U.S. Cl. 296—22 **8 Claims**



6. A cooking apparatus comprising:

a base supporting plate for attaching said apparatus to a recreational vehicle,

a vertically extending support member secured on said supporting plate,

said vertically extending support member being a hollow tubular member having one end attached to said supporting plate and its other end open,

a pivot member comprising a smaller tubular member having one end extending downward into said open end of hollow tubular support member,

a bracket secured on the other end of said pivot member,

said smaller tubular pivot member removably received within said open end of said hollow tubular member with sufficient clearance to permit rotary motion therebetween,

a pair of horizontally extending parallel support members attached to said bracket,

a box shaped cooking enclosure having a bottom, front and back side walls, end side walls, and a top lid member, and

one of said end side walls having openings therein and tubular sleeves secured therein to slidably receive said horizontally extending parallel support members for removably supporting said cooking enclosure on said parallel support members.

4,518,190

HINGE UNIT FOR A SEAT, PARTICULARLY A POWER VEHICLE SEAT

Bernd Klüting, Radevormwald, Fed. Rep. of Germany, and Vikram H. Zaveri, Springfield, Mich., assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheld, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,103

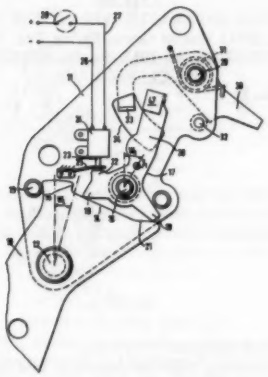
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046888

Int. Cl.³ B60N *1/02*

U.S. Cl. 296—65 R **9 Claims**

1. A hinge unit for a seat, particularly a seat of a power vehicle, comprising a fixed hinge element to be associated with a seat part of a seat and including an upper region provided with a recess having an end abutment; a pivotable hinge element to be associated with a back part of the seat and pivotally connected with said fixed hinge element; a two-sided catch lever formed as an inertia lever and pivotally connected with said pivotable hinge element, said catch lever having a locking projection engageable with said abutment of said fixed hinge element, and a heavy arm with a weight urging said catch lever so that said projection assumes its free position; and retaining means deactuatable in response to actuation of a control element of the power vehicle and urging said catch lever so that

the latter assumes during power vehicle travel its locking position under the action of said retaining means, and in the event of an accident resulting in failure of said retaining means, said catch lever is also held in its locking position because it is



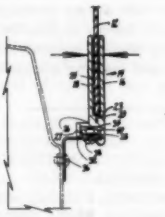
formed as an inertia lever, under the action of inertia force, said retaining means including a heatable retaining element arranged to urge said catch lever to its locking position while being heated.

4,518,191

AIR CURRENT DEFLECTOR SHIELD AND BRACKET COMBINATION

Robert D. Williams, Des Moines, and James Mastin, Corydon, both of Iowa, assignors to Deflecta-Shield Corporation, Corydon, Iowa

Filed Feb. 22, 1982, Ser. No. 351,184
Int. Cl.³ B60J *1/20*
U.S. Cl. 296—91 **4 Claims**



1. An air current deflector shield, comprising:

a shield member of a single piece of unbroken transparent material;

an elongated bracket having a shield receiving channel, and a securing strap receiving means for adjustable receipt of securing straps;

said shield receiving channel being defined by a forward wall, a bottom wall, and a rearward wall, said bottom wall having a longitudinal slit along its length to allow said forward and rearward walls to be spread open for easy insertion of said shield member, and following closing pressure on each wall to allow said forward and rearward walls to be folded inwardly to provide gripping pressure on said shield member; and

said securing strap receiving means comprising a bolt-receiving T-shaped channel associated with said bottom wall of said bracket extending along the length of said bracket, and a strap receiving slot extending along the length of said bracket below said bolt-receiving channel, the bolt-receiving T-shaped channel being defined by a top wall, two downwardly extending spaced-apart front and back walls, and inwardly extending shoulders from the bottom of said front and back walls to form a T-shape in cross-section channel extending the length of said bracket with a downwardly facing slot running therealong, and said strap receiving slot being defined by said shoulder of said front downwardly extending walls of said bolt-receiving channel, a front wall extending downwardly from said front wall of said bolt-receiving channel, and a bottom wall extending rearwardly from the bottom end of said front wall of said strap receiving slot.

4,518,192

SUN-GLARE SHIELD IN PARTICULAR FOR AN AUTOMOBILE VEHICLE

Jean C. Canadas, Remiremont, and Gilles Vigo, Rupt sur Moselle, both of France, assignors to Compagnie Industrielle de Mecanismes en abrege C.I.M., France

Filed Aug. 19, 1982, Ser. No. 409,738
Claims priority, application France, Sep. 28, 1981, 81 18233
Int. Cl.³ B60J *3/00*
U.S. Cl. 296—97 H **2 Claims**

1. A sun-glare shield comprising a first hollow semi-shell of injected plastics material and a second semi-shell of a foam of plastics material assembled with each other, said first semi-shell defines a window, which window is internally bordered by framing projecting portions, a mirror is positioned by said projecting portions, at least one boss is provided on an inner side of the second semi-shell and the mirror is maintained applied against an inner side of the first semi-shell by said at least one boss, a decorative covering covers the sun-glare shield, said at least one boss carries a covering which matches the covering of the sun-glare shield and the mirror is provided with shifting means and is slidably guided by said projecting portions for retracting the mirror from said window.

4,518,193

TOP CLOSURE FOR A RECTANGULAR BOX AND METHOD FOR USING SAME

Merle J. Heider, 203-12th St., S.W.; Dale J. Heider, 1108-8th Ave. S.W., and Leon J. Heider, R.R., all of Humboldt, Iowa 50548

Filed Jul. 12, 1984, Ser. No. 630,286
Int. Cl.³ B60J *11/00*
U.S. Cl. 296—98 **8 Claims**

1. A top closure for a rectangular box having a pair of opposite end walls and a pair of opposite side walls, said box having a top opening adjacent the upper edges of said end and side walls, said top closure comprising:

a flexible sheet member having first and second opposite edges and being sized to fit in covering relation over said top opening;

anchor means attaching said first edge of said sheet member to one of said side walls adjacent said upper edge thereof;

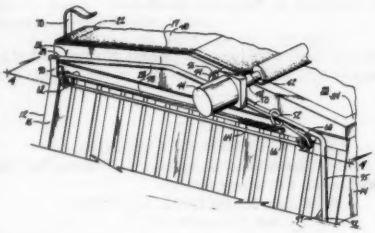
each of said upper edges of said end walls being provided with track means, each of said track means being elon-

gated and extending from one said box side wall to the other of said box side walls;

an elongated shaft having opposite ends retentively engaged by said track means for movement from an open position wherein said shaft is adjacent said one box sidewall to a closed position wherein said shaft is adjacent said other box sidewall;

spring means interconnecting said box and said shaft for yieldably urging said shaft to said closed position;

said shaft being attached to said second edge of said sheet member with said sheet member being wound around said shaft when said shaft is in said open position, said shaft being capable of turning and unwinding said sheet member while moving from said open to said closed position;



power means connected to said shaft for rotating said shaft to wind and unwind said sheet member;

securing means connected adjacent said upper edge of said other side wall for retentively engaging said shaft when shaft is in said closed position;

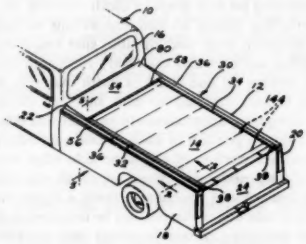
said securing means comprising at least one flexible flap having a first end and a second end, said first end being attached to said other sidewall so as to hold said second end in a position which is in the path of said rotating shaft as said shaft moves from said open to said closed position, whereby said second end of said flap will wind around and become attached to said shaft during continued movement of said rotating shaft to said closed position.

4,518,194

AUTOMATIC TRUCK BED COVER ASSEMBLY

Robert L. Kirkham, Rte. 6 Nat Cox Rd., Cartersville, Ga. 30120, and Garland F. Forrest, Jr., 12011 Winston Ct., Louisville, Ky. 40229

Filed Nov. 23, 1983, Ser. No. 554,504
Int. Cl.³ B60J *7/10*
U.S. Cl. 296—100 **7 Claims**



1. A cover assembly for a truck having an open-topped bed with upstanding side panels, a front end wall and a tailgate, the cover assembly comprising:

a. a track formed by a pair of parallel rails of C-channel configuration, where each rail is adapted to be mounted to the top of the side panels of the truck bed and to extend inwardly therefrom, each rail having an elongated slot extending longitudinally of the rail and being located on the side of the rail facing a similar slot on the other rail;

b. each of the parallel rails extending at their front end partially into an enlarged storage box that is adapted to fit down into the truck bed, and the box is to extend transversely thereof from one side of the bed to the other;

c. said track being furnished with a travelling rectangular frame having a pair of flexible side portions formed by a plurality of hinged slide bars that are positioned within the said parallel rails, a cross brace at the front end of the frame joining the first slide bar of the opposite side portions of the frame, and a sealing cross brace at the rear end of the frame that connects the last slide bar of each side portion of the frame and also is adapted to overlie the top portion of the tailgate so as to prevent rain from entering the truck bed in the vicinity of the tailgate;

d. said hinged slide bars in each side portion of the frame being separated by a short link and hinged thereto so that the flexible side portions of the frame may assume accordion folds when the frame is shifted forwardly within the track causing the hinged slide bars to ride off of the front end of the rails of the track and to fold neatly within the said storage box;

e. and a sheet of flexible material fitted over the said travelling rectangular frame for covering the truck bed when the frame is in rearward position, said flexible sheet being fastened to the hinged slide bars and extending through the elongated slots in the sides of the parallel rails of the track, and a transverse slot in one wall of the storage box extending between the parallel rails to allow the flexible sheet to enter and leave the box with the travelling frame;

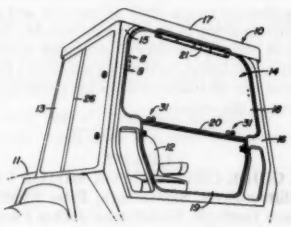
f. and motive means within the storage box for engaging the hinged slide bars and controlling the movement and location of the travelling frame and its cover sheet.

4,518,195

WINDOW STRUCTURE FOR TRACTOR CAB

Gary W. Tindall, Hazel Green, Wis.; George P. Lysenko, Dubuque, Iowa; Richard J. Vize, Dubuque, Iowa; Edward H. Kiefer, Dubuque, Iowa, and Richard J. Smith, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 25, 1984, Ser. No. 573,550
Int. Cl.³ B60J *1/18*
U.S. Cl. 296—148 **8 Claims**



1. A window structure for closing an opening in an upright wall of a cab structure composed of upper and lower glass panels with adjoining horizontal edges and positioned in upper and lower portions of the opening, horizontal hinge means connecting the upper portion of the upper panel to the cab structure for permitting the upper panel to swing inwardly between an open position in which the upper panel is closely adjacent and in underlying relation to the roof of the cab and a closed position in said opening; structure mounted on the cab structure adjacent the lower portion of the opening and on the inner face of said upper panel having upwardly opening notches for receiving the lower edge of the lower panel; complementary latch elements on the lower panel, the cab struc-

ture and the inner face of said upper panel for retaining said lower panel in its closed position when its lower edge is seated in the notches of said structure on the cab structure, and on the inner face of said upper panel for retaining said lower panel on the inner side of said upper panel when its lower edge is seated in the notches of the structure on the inner face of said upper panel; an elongated, extendable member biased toward extension pivotally mounted at opposite ends to the cab structure and said upper panel, said line of force of said elongated member swinging to opposite sides of the axis of said hinge means as the upper panel moves towards its open and closed positions.

4,518,196

MOTOR VEHICLE WITH INTEGRALLY FORMED HYDRAULIC AND/OR AIR LINES

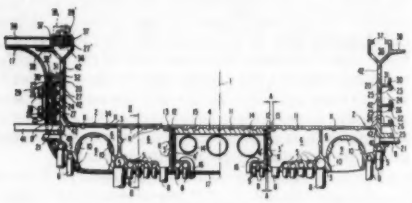
Alfred Förster, Weinstadt; Willi Geyer, Oberboingen, and Leo Kober, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 367,079

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114403

Int. Cl.³ B62D *33/00*

U.S. Cl. 296—204 **25 Claims**



1. A line network arranged in a motor vehicle for at least one of hydraulic and pneumatic media, the line network comprising at least one extruded member having a predetermined length extending from a front to a rear area of the motor vehicle, a plurality of enclosed areas formed in the at least one extruded member for defining lines for accommodating the media, said at least one extruded member including enclosed areas of larger cross section defining reservoirs for accommodating the media, said at least one extruded member including at least one channel means open on one side and extending in a longitudinal direction of the extruded member for accommodating at least one of a plurality of elongated members, at least one support means formed as one of a plate and a flange surface on the at least one extruded member for enabling a support of a component of the vehicle.

4,518,197

WATER GUIDE CHANNEL FOR MOTOR VEHICLES

Joseph Gallitzendörfer, Sindelfingen; Peter Pfeiffer, Boeblingen; Johann Tomforde, Sindelfingen; Jochen Pärisch, Herrenberg, and Gerhard Zweigart, Aidlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

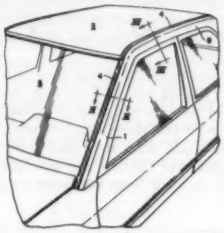
Filed Apr. 20, 1983, Ser. No. 486,945

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214876

Int. Cl.³ B62D *25/00*

U.S. Cl. 296—213 **6 Claims**

1. A water guide channel for motor vehicles comprising a continuous profile strip running along the windscreen pillar and the roof of a motor vehicle, the profile strip having a constant cross-sectional shape over its entire length, the profile strip in the region of the windscreen pillar forming a wall part of a water guide channel open towards the center of the motor vehicle, the profile strip in a generally horizontal roof region completely covering the top of a channel formed by depressions in an external skin of the roof thereby forming the water



guide channel in the roof region by means of a free end of a leg of the profile strip and the external skin of the vehicle roof.

4,518,198

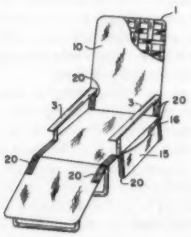
LAWN FURNITURE COVERING

Jean G. Daniels, Richmond, Va., assignor to William Jay Monahan, Richmond, Va., a part interest

Filed Aug. 21, 1981, Ser. No. 294,994

Int. Cl.³ A47C *31/10*

U.S. Cl. 297—229 **9 Claims**



1. A lawn furniture covering to be spread on lawn furniture for a person to lie on and for forming a tote container when it is not on said lawn furniture, said covering comprising:

an elongated, substantially rectangularly shaped, sheet of cloth material for covering supporting surfaces of said lawn furniture upon which said person rests, said sheet having a body-receiving side on which said person lies and a durable side which faces the outside when said covering is configured to form said tote container;

means mounted on said sheet of cloth material for attaching said covering means to said supporting surfaces of said lawn furniture with said durable side being against said supporting surfaces and said body-receiving side facing a person resting on said sheet of cloth material; and

attaching means attached to said sheet of cloth material along elongated, approximately parallel side edges thereof for coupling a portion of each of said side edges together with another portion of the same side edge whereby the ends of said elongated sheet of cloth material can be folded toward one another to form a container and the elongated side edges thereof can be coupled to themselves by said attaching means to retain said covering in said container configuration for converting said covering into said tote container, said covering further including pocket flaps flexibly attached to said side edges of said elongated, substantially rectangular, sheet of cloth material and extending outwardly therefrom when said covering is laid flat but hanging down when said covering is lying on lawn furniture, said pocket flaps each having a pocket therein for storing items within reach of one using said lawn

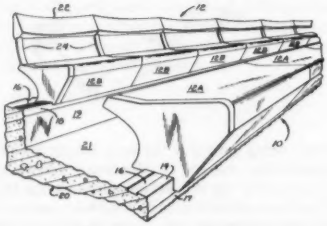
furniture, said pocket flaps further having attaching means mounted along side edges thereof which extend laterally to the elongated side edges of said elongated, substantially rectangular sheet of cloth material whereby the side edges of said flaps can be attached to the adjacent elongated side edges of said rectangular sheet of cloth material to thereby couple each of said portions of each of said side edges together with the respective other portion of the same side edge by means of a pocket flap and thereby retain said covering in said container configuration, said pocket flaps forming walls of said container.

4,518,199

CONTOUR SEAT MODULE

Robert E. Lewis, Urbana, Ill., assignor to American Seating Company, Grand Rapids, Mich.

Filed Jan. 18, 1982, Ser. No. 339,904
Int. Cl.³ E04H *3/12*; A47C *15/00*
U.S. Cl. 297—248 **27 Claims**



1. A plurality of separate seat modules arranged in adjacent contacting relation in a linear seating arrangement above the riser of a tiered seating structure, each seat module fixedly mounted on a rigid support member and comprising: an integral molded body having an upper seating panel contoured only in a fore-to-aft direction to support a person sitting thereon, a front panel extending downward from said seating panel, a rear panel extending downward and forwardly of said upper panel, a base extending between the lower portions of said front and rear panels, each seat module further including two end portions, with each of said end portions including interlocking structure positioned on the perimeter thereof for interconnecting adjacent seat modules mounted on said rigid, support member; integral structural support wall means for increasing the load bearing capacity of said module; and mounting means assembled to said base from the top and within each seat for fixedly mounting said seat module on said rigid support member; the interior of said seats being generally hollow and said seat panel located above said base a substantial distance sufficient to provide access to said mounting means, said seats characterized in that when a plurality of said seats are assembled in side-by-side relation, top seating surfaces of adjacent seats form a substantially continuous bench-like seating surface.

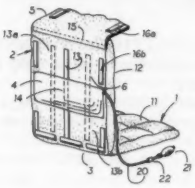
4,518,200

SEAT PAD WITH ADJUSTABLE LUMBAR SUPPORT

William H. Armstrong, 2552 Hampshire, SE., Grand Rapids, Mich. 49506

Filed Sep. 28, 1982, Ser. No. 425,327
Int. Cl.³ A47C *27/08*
U.S. Cl. 297—284 **10 Claims**

1. A seat pad with an adjustable lumbar support comprising:
a seat element and a back element pivotally secured together along the juncture formed at the rear edge of the seat element and the lower edge of the back element;
said seat and back elements each including a body having an inner surface which faces an occupant when seated on said seat pad and an outer surface which faces the support on which the seat pad is to be supported;
said body of said back element having sufficient rigidity along portions of its periphery to render said back element self-supporting in a vertical position, the intermediate portions between said peripheral portions being flexible and the outer surface being exposed to provide access thereto;
a first hooked and napped loop means secured to the said outer surface of said back element and extending between the lower and upper edges thereof;
an elongated air inflatable bladder positioned on the exposed outer surface and adjacent to the intermediate portion of said body of said back element such that the full thickness of the intermediate portion of said body is interposed between said air bladder and an occupant when said occupant is seated in said seat pad whereby inflation of said air bladder deforms the entire thickness of the intermediate portion of said body; said air bladder including a second hooked and napped loop means secured to one side thereof and cooperative with said first hooked and napped loop means for removably supporting said bladder at different selected positions on the outer surface of said back between the upper and lower edges thereof, the exposure of said outer surface providing access to said bladder for removing and adjusting said bladder to different positions on said back surface; and
said back element being sufficiently flexible in its intermediate portion so as to flex in response to pressure exerted by said inflated bladder whereby when an occupant sits in said seat pad additional support is provided to the lumbar region of said occupant's back.

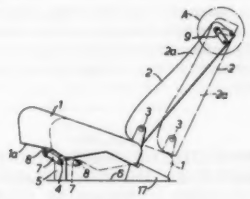


4,518,201

REAR SEAT FOR USE IN A MOTOR VEHICLE

Ernst Wahlmann, and Karl-Heinz Klausing, both of Meerbeck, Fed. Rep. of Germany, assignors to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,209
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206293
Int. Cl.³ B60N *1/06*
U.S. Cl. 297—316 **9 Claims**



1. A rear seat for use in a motor vehicle having a front seat including a back rest, said rear seat including
a seat part having front and rear portions,
a back rest articulated to said rear portion of said seat part,

a spindle extending transversely adjacent said front portion of said seat part,

a first link having two ends, said link being pivotally mounted at one of said ends to said spindle and pivotally mounted at the other of said ends to said front portion of said seat part,

a second link having two ends, said second link being pivotally mounted at one said end to said back rest,

a journal bearing mounted to the other said end of said second link, and

a locking member movable between a locked and a released position, and mounted to the vehicle and adapted to secure said journal for rotation only when in its locked position, whereby when said locking member is in its released position said seat is able to adopt an inoperative position in which said seat part is substantially parallel to the back rest of the front seat.

4,518,202

SEATING PIECE OF FURNITURE

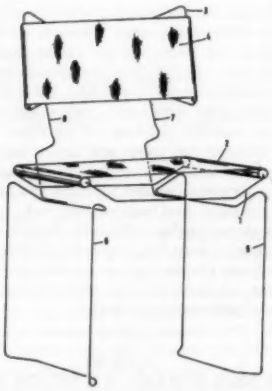
Hans-Ulrich Bitsch, Schanzenstr. 1, 4000 Düsseldorf 11, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,043

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210525

Int. Cl.³ A47C *7/02*

U.S. Cl. 297—452 **15 Claims**



1. A seating piece of furniture especially entirely of non-combustible material, which comprises in combination:

a frame including two frame longitudinal portions having outer edges arranged in parallel spacing to each other in a manner elastically deformable under load as well as including two transverse frame portions structurally elastically deformable and connected to said two longitudinal portions; and

flexible seat fastened to the two frame longitudinal portions of said frame retaining said transverse frame portion in an elastically deformed position thereby holding said flexible seat permanently in a stressed spring back relationship therewith.

4,518,203

CONVERTIBLE CUSHION FURNITURE

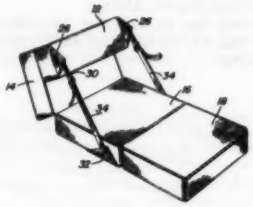
Kirk E. White, P.O. Box 204, Silver Springs, Nev. 89429

Filed Dec. 2, 1983, Ser. No. 557,489

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—456 **8 Claims**

1. A convertible cushion furniture assembly, said assembly including four generally rectangular cavity defining flexible housings each including six interconnected panel portions, said housings each being filled with a loose lightweight filler material to form a generally rectangular parallelopiped cushion which is shape retentive, but somewhat deformable and capable of conforming, at least to some degree, to a body part engaged therewith, said cushions being disposed in end-to-end relation and positionable on a plane surface with either first or second corresponding face surfaces of said cushions opposing said plane surface, each pair of adjacent cushion ends being connected together for relative angular displacement about a transverse axis with the axes of relative angular displacement of adjacent cushions extending along corresponding end transverse marginal portions of said first corresponding face surfaces of said cushions, said cushions being generally the same transverse width and height, three adjacent cushions of said



four cushions being generally the same length with the fourth cushion comprising one end cushion being generally one half the length of each of the other three cushions, the longitudinal edges of the first face surface of said one end cushion including first anchor flaps extending therealong and secured thereto for angular displacement relative to said one end cushion about axes extending along said longitudinal edges, the longitudinal edges of the first face surface of a second cushion immediately adjacent the other end cushion including second anchor flaps extending therealong and secured thereto for angular displacement relative to the second cushion about axes extending along the last-mentioned longitudinal edges, and adjustable length flexible elongated tension member means releasably connected between pairs of corresponding first and second flaps.

4,518,204

WHEEL FOR A VEHICLE

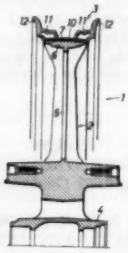
Minoru Takada, Hoya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,599

Claims priority, application Japan, May 10, 1982, 57-76529

Int. Cl.³ B60B *23/00*; B21D *53/26*

U.S. Cl. 301—63 R **10 Claims**



1. In am improved wheel for a vehicle including an annular rim adapted to carry a tire thereon and a wheel center, said annular rim being press-fitted onto an outer peripheral part of said wheel center, the improvement wherein said annular rim is formed symmetrical with respect to a vertical center line of the

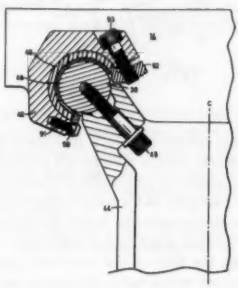
wheel and comprises a central well portion, a pair of bead seat portions located adjacent the well portion, a pair of flange portions located axially outside the bead seat portions, said bead seat portions and said flange portions having a rigidity higher than that of the central well portion, and an inner circumferential fitting surface having such an axial width that the surface extends over the well portion and at least a part of the respective bead seat portions, while said wheel center is formed symmetrical with respect to said vertical center line and comprises an outer circumferential fitting surface to be fitted with said inner circumferential fitting surface of the annular rim in an assembled state, whereby said inner circumferential fitting surface of the annular rim deforms, when it has been press-fitted onto the outer circumferential fitting surface of the wheel center with an adhesive agent interposed therebetween, to define between those fitting surfaces a space of a crescent-shaped cross-sectional configuration due to difference in strain between the central well portion and the bead seat portions and flange portions caused by difference in rigidity therebetween, said crescent-shaped space being filled with a layer of said adhesive agent having a maximum thickness of 0.05 to 0.5 mm at an axial center thereof and decreasing toward both axial side ends thereof for secure connection between the annular rim and the wheel center.

4,518,205

SLIDING BEARING

William R. Heathe, Weston, Canada, assignor to Baxter Technologies Inc., Bloomfield Hills, Mich.

Filed Nov. 14, 1983, Ser. No. 550,811
Claims priority, application Canada, Jun. 3, 1983, 429681
Int. Cl.³ F16C *29/12*
U.S. Cl. 308—3 R **20 Claims**



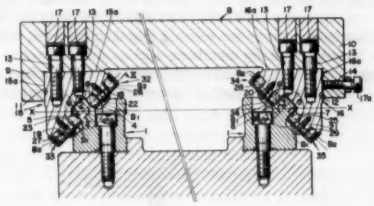
1. In a precision slide comprising a linear shaft defining a longitudinal axis and a slide member constrained thereby to be moved longitudinally, a bearing assembly comprising a bearing block having an axially extending cavity defining a passageway through which the shaft extends, the cavity having a wall arranged coaxially with the shaft, a resilient bearing member within the cavity, the bearing member having an internal bearing surface in cooperative sliding engagement with the shaft and an external surface spaced from the cavity wall, an elastomeric medium substantially filling the space between the external surface and the cavity wall, said elastomeric medium being urgable in a direction transverse to its thickness so as to cause an inward movement of said internal bearing surface and means for adjustably urging the elastomeric medium in said transverse direction for adjustably varying the clearance between said internal bearing surface and the shaft.

4,518,206

LINEAR SLIDE ROLLER BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,206
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **6 Claims**



1. A linear slide roller bearing unit comprising:

a pair of right and left track shafts extending in the longitudinal direction of said linear slide roller bearing unit, each track shaft being constituted by a block member with a substantially triangular cross-section having loaded roller rolling surfaces formed on both side surface portions of a ridge orthogonally projecting from the center of an outer inclined surface portion thereof;

a movable table constituted by a long block member of substantially U-shaped cross-section disposed so as to straddle said track shafts, said movable table being provided with longitudinal recesses respectively formed in the opposing inner surfaces of skirt portions thereof;

a pair of right and left bearing bodies each constituted by a long block member of substantially triangular cross-section which is screwed to the corresponding recess in said movable table, each bearing body having a pair of guide ridges respectively projecting from both side edges of an inner inclined surface portion of said block body, each guide ridge having one side surface thereof defined as a loaded roller rolling surface confronting the corresponding loaded roller rolling surface of the associated track shaft and the other side surface defined as a non-loaded roller rolling surface;

barrel-shaped rollers adapted to be recirculated along said loaded roller rolling surfaces and non-loaded roller rolling surfaces of said bearing bodies and to come in contact with said loaded roller rolling surfaces on said track shafts when rolling along said loaded roller rolling surfaces on said bearing bodies; and

a roller retainer attached to each of said guide ridges so as to face the corresponding inner inclined surface portion of the associated bearing body and adapted to guide said rollers so that they can recirculate through the space defined between said roller retainer and inner inclined surface portion,

wherein said rollers in the state of serving as loaded rollers are brought into contact with said loaded roller rolling surfaces on said track shafts at a contact angle of about 45°, within the same plane, with respect to corresponding imaginary oblique lines each passing through the center of said ridge of the associated track shaft and intersecting the horizontal axis of said linear slide roller bearing unit at an angle of about 45°.

4,518,207

MODULE LATCHING MECHANISM

German Gavronsky, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 14, 1983, Ser. No. 541,832
Int. Cl.³ A47B *87/00*
U.S. Cl. 312—107.5 **2 Claims**

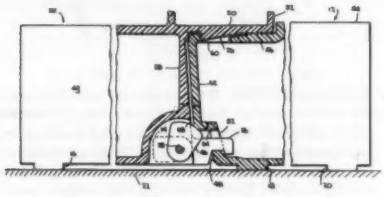
1. A latching mechanism for releasably joining and locking

together two separate modules located on a flat surface, comprising:

a first module having a pair of lower fingers projecting therefrom and a pair of angular, locking members projecting therefrom, said first module also having a shaft rotatably mounted in the lower portion of said first module and a pair of rotary front legs and a pair of stationary rear legs, said rotary front legs being fixedly secured to said shaft;

a second module having a pair of lower apertures for locking engagement with said pair of lower fingers and a pair of upper apertures for locking engagement with said pair of angular, locking members; and

said front legs operative to abut said flat surface, thereby supporting the front of the module in a raised position,



said first module having an overhanging portion extending along the front thereof that is adapted to extend above a recessed portion of the second module,

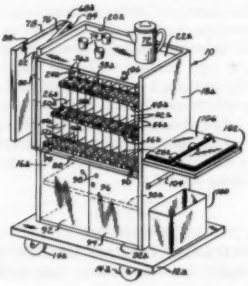
a cam fixedly secured to said shaft at an angular displacement from said front legs, said second module having a cam follower surface, wherein rotation of said shaft effects rotation of said rotary, front legs from said supporting position to thereby lower said first module from said raised position onto said second module when the lower fingers engage the lower apertures, and wherein continued rotation of said shaft effects continued rotation of said cam causing the cam to abut the cam follower surface to thereby urge and the recessed portion of said second module upwardly against the overhanging portion of said first module, causing said two modules to be rigidly locked together.

4,518,208

APPARATUS AND METHOD FOR DISPENSING MEDICINE

Herbert B. Marder, 177 Lakewood Pl., Highland Park, Ill. 60035

Filed May 12, 1983, Ser. No. 493,931
Int. Cl.³ A47B *81/00*
U.S. Cl. 312—209 **2 Claims**



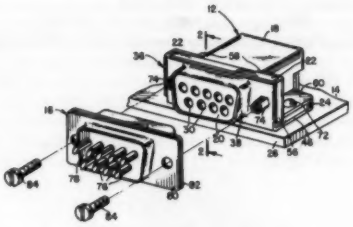
1. A cart for use in supplying medications to a plurality of patients comprising a base, wheel means on said base for moving said cart about, means upstanding from said base providing a plurality of laterally accessible bins each having an entrance, said plurality of bins having a common top wall and a common bottom wall and a common rear wall, and the bins respectively being further defined by fixed upstanding side walls, each bin being relatively high and narrow, each bin being assigned to a respective patient, means adjacent each bin identifying the patient to which it is assigned, each bin containing a patient card on edge in substantially upright position and a long term supply of disparate medicines for that patient, horizontal support means adjacent each bin entrance substantially forming a continuation of said bottom wall, said support means having a plurality of upwardly opening recesses therein respectively aligned with said bins and each comprising a substantially circular aperture sized to receive a disposable cup, and a disposable cup in each of at least selected ones of said recesses of said support means for holding the medicine to be dispensed to the respective patient at a given time according to the adjacent patient card in the respective bin.

4,518,209

CONNECTOR BLOCK WITH RF SHIELD

Loren E. Negley, Carlisle, Pa., assignor to Welcon Connector Company, New Cumberland, Pa.

Filed Jun. 30, 1983, Ser. No. 509,404
Int. Cl.³ H01R *4/66, 13/648*
U.S. Cl. 339—14 R **8 Claims**

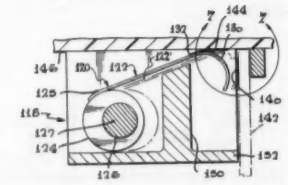


1. A shielded connector block including an insulating body having an elongate nose, a nose flange to either end of the nose, circuit board flanges on either side of the body joining the nose flanges, and a plurality of terminal recesses extending from the face of the nose through the body; terminals in the terminal recesses for making electrical connections with contacts inserted through the face of the nose and into the ends of the recesses; a unitary metal radio frequency interference ground shield including a mounting plate on the nose flanges, a barrel extending outwardly from the plate and surrounding the nose, and mounting lugs extending from the plate at opposite ends of the barrel; each lug including a flange cover extending across the adjacent nose flange, a nose flange mounting tab on the back of the nose flange and a circuit board flange mounting tab extending at right angles from the nose flange mounting tab on top of a circuit board flange; mounting holes extending through the plate, the nose flanges, circuit board flanges, the circuit board flange mounting tabs and the nose flange mounting tabs; means for connecting the shield to ground circuitry, whereby the shield may be physically secured to the body by mounting means extending through the mounting holes in the plate, nose flanges and nose flange mounting tabs and the block may be secured to a circuit board by mounting means extending through the mounting holes in the circuit board flange mounting tabs and the circuit board flanges.

4,518,210
ZERO-INSERTION-FORCE HOUSING FOR CIRCUIT BOARDS

Robert A. Morrison, Long Beach, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Aug. 10, 1983, Ser. No. 521,802
Int. Cl.[3] H01R 9/09
U.S. Cl. 339—17 LM 34 Claims



1. An electrical connector for a housing having a zero insertion force electrical socket, said socket having a plurality of first electrical terminals and further adapted to receive an edge portion of a printed circuit board, said circuit board having a plurality of second electrical terminals mounted thereon, in a manner such that when said circuit board is installed in said socket, said plurality of first electrical terminals is at substantially right angles to said plurality of second electrical terminals, said electrical connector comprising:

a spring member, having first and second ends positioned within said housing along said plurality of first electrical terminals, said first end terminating in a curved member having a plurality of electrical contacts in slideable engagement with said plurality of first terminals; and

a cam means, rotatably mounted within the housing, and attached to said second end of said spring member positioned so as to cause said spring member to maintain said plurality of electrical contacts in slideable engagement with said plurality of first electrical terminals and adapted, when actuated, to force said plurality of electrical contacts into engagement with said plurality of second electrical terminals on said circuit board while maintaining electrical contact with said plurality of first electrical terminals.

4,518,211
DEVICE FOR MOUNTING, INTERCONNECTING AND TERMINATING PRINTED CIRCUITS

William E. Stepan, Clarendon Hills; Wayne E. Neese, Hoffman Estates; Thomas D. Belanger, Jr., Hinsdale, and Robert F. Janninck, Elmhurst, all of Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 26, 1983, Ser. No. 536,073
Int. Cl.[3] H01R 23/68
U.S. Cl. 339—17 LM 4 Claims

1. A device for mounting, interconnecting and terminating printed circuits comprising:

a frame of insulating material including first and second major sides and first and second minor sides;

a fixed component mounting surface integrally joined to said frame between said first and second major sides and said first and second minor sides, said fixed component mounting surface including printed circuits affixed on a face thereof;

mounting means integrally joined to an inner face of said first major side and said second major side, said mounting means arranged to accept a removable component mounting surface having printed circuits fixed on a face thereof;

a first plurality of terminal means each including a terminal connector engaging portion on an outer face of said first minor side for connecting to a source of input/output signals and contact portions extending from an opposite face of said first minor side, each of said contact portions communicating with an associated printed circuit of said fixed component mounting surface;

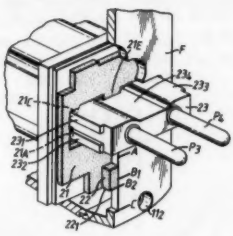
a second plurality of terminal means each including a terminal connector engaging portion on an outer face of said first minor side for connecting to a source of input/output signals and contact portions extending from an opposite face of said first minor side, each of said contact portions communicating with an associated printed circuit of said removable component mounting surface;

a plurality of openings extending through said second minor side, said openings arranged to accept a plurality of electrically conductive U-shaped members, each U-shaped member arranged to be accepted within one of said second minor side openings with a first leg of said U-shaped member contacting a printed circuit of said fixed component mounting surface and a second leg contacting a printed circuit of said removable component mounting surface whereby, said U-shaped members electrically connects the printed circuits of said fixed component mounting surface to the printed circuits of said removable component mounting surface and mechanically retains said removable component mounting surface to said frame.

4,518,212
MULTIPLE PIN ELECTRICAL PLUG

Clive S. Rumble, London, England, assignor to Corabelment A.G., Vaduz, Liechtenstein

Filed Aug. 12, 1982, Ser. No. 407,571
Int. Cl.[3] H01R 27/00
U.S. Cl. 339—31 R 2 Claims



1. A multiple pin electrical plug for selectively providing electrical pins in different configurations corresponding to different electrical sockets, comprising:

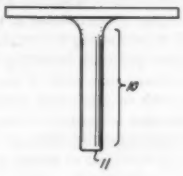
a plurality of selectively extendable pins;

a shutter plate movable by a hand operated slider between a plurality of discrete positions for selecting one of said different configurations and permitting extension of predetermined ones of said pins, at least one pair of said pins being provided on a prismatic sliding member, said sliding member having guide rails said shutter plate having protuberances co-operating with said guide rails to permit said sliding member to be extended from or retracted into said plug when said shutter plate is in one of said discrete positions and to permit movement of said shutter plate into another discrete position, preventing retracting of said sliding member, when the latter is extended.

4,518,213
ONE PIECE HERMAPHRODITIC CONTACT FOR AN ELECTRICAL CONNECTOR AND A METHOD OF MAKING THE CONTACT

David O. Gallusser, Oneonta, N.Y., assignor to Allied Corporation, Morristown, N.J.

Filed May 31, 1983, Ser. No. 499,694
Int. Cl.³ H01R *25/00*
U.S. Cl. 339—48 7 Claims



1. A one-piece contact comprising a cylindrical forward mating portion drawn and formed from a single piece of metal, said forward mating portion including at least two elongated members helically twisted about each other along a central axis to form an axially retractible spring portion with each said member terminating at a closed forward end having a planar surface perpendicular to the central axis, each of said elongated members helically overlapping as they twist about to define the mating portion.

4,518,214
DEVICE FOR THE ELECTRIC CONNECTION OF A CYLINDRICAL CONDUCTOR

Marcel Caris, 16, rue Francois Mansart, 92350 Le Plessis Robinson, France

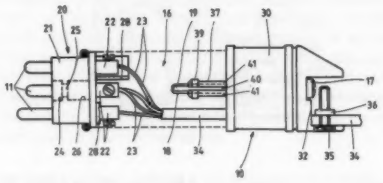
Filed Apr. 19, 1983, Ser. No. 486,320
Claims priority, application France, Apr. 26, 1982, 82 07140
Int. Cl.³ H01R *13/629, 11/20*; B23P *23/00, 19/00*
U.S. Cl. 339—74 R 12 Claims

1. A device for electrically connecting a cylindrical conductor, said device comprising at least one fork having two members each having a cutting edge, the conductor to be connected being forced in and gripped between said cutting edges, each of said two members having an arm extending therefrom, the device also comprising means for inserting and extracting the conductor to be connected, said means having a shape so as to move the ends of the arms away from one another when the conductor is introduced and keep said arms apart a distance such that the distance apart of the cutting edges at the level of the conductor is slightly less than the diameter of the conductor.

4,518,215
MULTI-POLE ELECTRIC PLUG

Wolfgang Schwarzhoff, Lüdenscheid, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,804
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243729
Int. Cl.³ H01R *13/506, 13/621*
U.S. Cl. 339—92 R 8 Claims



1. A multi-pole electric plug and socket combination, comprising

said plug having an inner and an outer housing nested in one another and held together by at least one fastening element,

said inner housing comprising contact prongs and oppositely disposed connections protruding therefrom,

said outer housing having a cavity open toward and receiving said inner housing,

said socket having receptacles for receiving said contact prongs,

said fastening element comprising a snap connector means for locking together said inner and outer housing,

said snap connector means comprising a finger means protruding in the locking direction from one of said outer housing and inner housing and having a snap head, and on one of said inner housing and said outer housing a recess allowing said finger means to pass therethrough and engaged therein in a locking manner by said snap head, and wherein said finger means has passing therethrough a screw of relatively longer length then said finger means, and on a segment located on one end thereof is a thread for fitting into a central threaded sleeve of said socket for securing said plug and socket together, wherein the outer diameter of said segment is approximately equal to the inner diameter of a passage in said finger means and said segment comprises a securing segment securing said snap head against radially yielding inwardly.

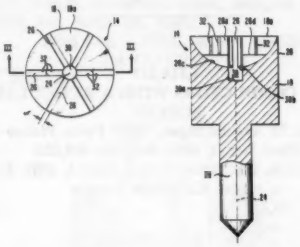
4,518,216
WIRE TERMINATION SYSTEM AND TERMINATOR THEREFOR

Edward P. Brandeau, Martinsville, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 7, 1982, Ser. No. 447,591
Int. Cl.³ H01R *9/08*
U.S. Cl. 339—97 P 21 Claims

1. A terminal for insulated wire comprising a conductive body having a slot defining an insulation removing portion within a surface of said body and extending transversely across said body a predetermined extent, said slot having along its extent a non-uniform depth as measured from said surface, said body including a generally cylindrical portion defining a central axis and a plurality of slots extending radially from said axis and spaced thereabout, said body further including a re-

cess extending therein along said central axis, said recess defining a bottom wall being deeper from said surface than said



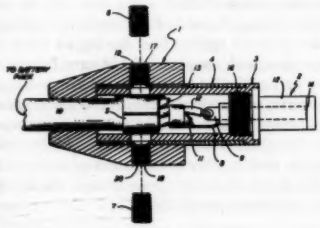
slots, each of said slots communicating with said recess adjacent said central axis.

4,518,217

ELECTRICAL CONNECTOR AND RECEPTACLE

John J. Corrigan, III, Carmel Hill Rd., Washington, Conn. 06793

Filed Apr. 8, 1983, Ser. No. 482,962
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—183 **3 Claims**



1. An electrical connector comprising:

two terminal electrical plug means having a first end for engaging with an electrical receptacle and a second end adapted to receive wire connections of an electrical cable, said first end having first cylindrical electrical contact means, insulating means disposed about said first contact means and second cylindrical electrical contact means disposed about said insulating means;

additional insulating means having a longitudinal opening having first and second ends, the second end of said two terminal electrical plug means disposed in said first end of said opening;

sleeve electrical contact means disposed about said additional insulating means;

insulating housing means disposed about and covering a part of said sleeve contact means and having an opening for receiving said electrical cable aligned with the second end of the opening of said additional insulating means; and

fastening means for fastening said electrical cable securely in said housing means and for making electrical contact between a conductor of said electrical cable and said sleeve contact means, said fastening means comprising:

screw means disposed in aligned openings in said insulating housing means and said sleeve contact means and engaging in an interference fit with the sides of the opening in said sleeve contact means; and

clamping collar means disposed about said electrical cable and in electrical contact with said conductor;

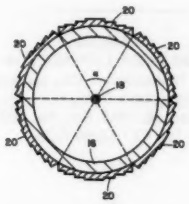
said screw means engaging said clamping collar means so as to securely hold said electrical cable in said insulating housing means and establish electrical contact between said clamping collar means and said sleeve contact means.

4,518,218

STEPPED POLYGON SCAN MIRROR

Neal Diepeveen, Fair Lawn, N.J., assignor to Magnavox Government and Industrial Electronics Co., Ft. Wayne, Ind.

Filed Sep. 26, 1983, Ser. No. 535,478
Int. Cl.³ G02B *3/02, 27/17*
U.S. Cl. 350—6.8 **15 Claims**



1. A mirror assembly for scanning incoming radiation from a scene onto one or more radiation detectors, said mirror assembly comprising:

a cylindrical mirror arrangement having n mirror faces arranged around an axis, n being an integer greater than or equal to two;

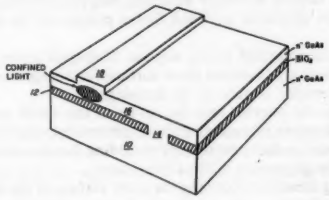
characterized in that each mirror face comprises a plurality of planar mirror segments, the mirror segments being arranged to form a stepped structure in which each mirror segment in a given mirror face is parallel to each other mirror segment in the mirror face.

4,518,219

OPTICAL GUIDED WAVE DEVICES EMPLOYING SEMICONDUCTOR-INSULATOR STRUCTURES

Frederick J. Leonberger, Lexington; Ivars Melngailis, Newton; Carl O. Bozler, Sudbury, and Robert W. McClelland, Weymouth, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 115,420, Jan. 25, 1980, Pat. No. 4,420,873. This application Feb. 3, 1983, Ser. No. 463,568
Int. Cl.³ G02B *5/174*
U.S. Cl. 350—96.12 **17 Claims**



2. A three-dimensional optical waveguide structure for guiding light comprising:

(a) a substrate;

(b) a first insulator layer formed on said substrate;

(c) light confining means comprising:

(i) a single crystal semiconductor layer formed upon said insulator layer, the index of refraction of said insulator layer being less than the index of refraction of said semiconductor layer and the thickness of said semiconductor layer being sufficient to confine light in a first

vertical direction by the boundary between the semiconductor layer and the insulator layer;

(ii) a second insulator layer over said semiconductor layer for confining light in a second vertical direction by the boundary between said second insulator layer and said semiconductor layer;

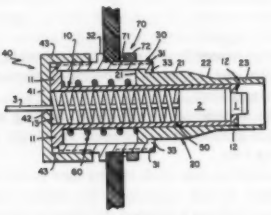
(iii) lateral light confining means comprising two side walls on said semiconductor layer extending towards but not reaching said first insulating layer to create an effective larger index of refraction within the region of said semiconductor layer within the two side walls of said three-dimensional optical waveguide to provide lateral confinement of said light.

4,518,220

FIBER OPTIC DRAWER CONNECTOR ASSEMBLY

Steven E. Swanson, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 30, 1983, Ser. No. 480,545
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—96.20 **2 Claims**



1. A fiber optic drawer connector assembly, the assembly comprising:

a unitary, generally cylindrical insert having a radially outwardly extending flange portion at one end and a radially inwardly extending flange portion at the other end, said insert providing an inner cavity for accommodating a lens assembly and an associated ferrule,

a unitary, generally cylindrical shroud surrounding at least a portion of the insert and having a flange portion at one end,

a housing surrounding at least a portion of the shroud and a portion of the insert and having a cylindrical contour with an interior surface and a threaded exterior surface, a flangelike member extending radially outwardly at an intermediate point on the exterior surface of the housing, and a radially inwardly extending stopping portion at one end for abutment with the flange portion of the shroud, and

a cap characterized by an angular U-shaped cross-section and having a threaded inner surface for engagement with the threaded surface of the housing,

a first spring inserted into the cavity of the insert, and

a second spring surrounding the insert and disposed between the insert radially outwardly extending flange portion and the flange portion of the shroud, and

retaining means surrounding the outer surface of the housing for maintaining the housing in a substantially fixed relationship with a planar surface through which the housing is inserted,

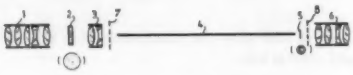
whereby a lens assembly and associated ferrule may be inserted into the shroud, the shroud into the housing so that the flange portion of the shroud tends to abut the stopping portion of the housing, the housing inserted through a complementary opening in a plane so that the housing flangelike member tends to abut a first surface of the plane, the retaining means positioned around the housing into contact with a second surface of the plane and the cap mated to the housing so that a central segment of the cap comes into contact with the radially outwardly extending flange portion of the insert whereby the first spring maintains the lens and associated ferrule in a secure position within the insert cavity.

4,518,221

IMAGE CONDUCTORS WITH A RETICULATED SCREEN

Fort Francois, 71 Ave. de Ségur, 75007 Paris, France

Filed Dec. 1, 1982, Ser. No. 446,035
Claims priority, application France, Dec. 3, 1981, 81 22624
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.26 **3 Claims**



1. A device for conducting an image of an object comprising:

a lens having an optical axis;

a screen positioned along said optical axis for receiving a projected image from said lens, said screen comprising openings or perforations of a few microns so as to provide an image formed of a plurality of light points;

a reducing lens positioned along said axis for producing a reduced image formed of a plurality of light points;

an index gradient optical fiber having an input face and an output face with the plane of said input face being substantially perpendicular to said optical axis and oriented so as to receive said reduced image and for transmitting said light points of said reduced image in a monomode way such that there is formed on said output face of said index gradient optical fiber the transmitted reduced image; and

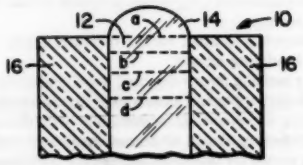
an eye-piece disposed opposite said output face of said index gradient optical fiber.

4,518,222

OPTICAL DEVICE AND METHOD

Nicholas F. Borrelli, Elmira, and Donald M. Trotter, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,294
Int. Cl.³ G02B *1/00, 27/00;* B29C *27/00;* C03C *21/00*
U.S. Cl. 350—167 **13 Claims**



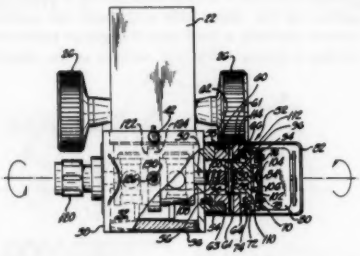
1. An optical device composed of a photonucleable, crystallizable, lithium silicate glass body having a clear glass lens array integral with and rising above at least one surface, each lens being surrounded by a crystallized glass matrix, and being characterized by a layer extending below the lens surface wherein the lithium ion content is below the glass composition norm, the content of a larger, exchangeable alkali metal ion is greater than the glass norm for that ion, and the distribution of such alkali metal ion in the lens is defined by both radial and axial concentration gradients.

4,518,223

AUTOMATIC MAGNIFICATION CHANGER FOR A SURGICAL MICROSCOPE

George F. Waters, Sturbridge, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Aug. 1, 1983, Ser. No. 519,292
Int. Cl.³ G02B 7/16
U.S. Cl. 350—254 14 Claims



1. A power operated drive for a magnification changer for a microscope comprising:

a magnification changer housing defining a cavity aligned in the optical path of said microscope, said housing adapted to support said microscope with respect to said cavity;

a magnification changer shaft at least a portion of which is mounted for rotation in said cavity;

an input shaft for said drive mounted with respect to said housing;

a selectably operable power source for simultaneously driving said input shaft through a predetermined angular rotation and a predetermined axial translation;

means for coupling said input shaft and said magnification changer shaft together adapted to simultaneously rotate and translate with said input shaft to index said magnification changer shaft through a predetermined angular rotation;

cooperative means having at least one first element disposed for rotation and translation with said coupling means and a second element fixed about said coupling means for stopping said magnification changer shaft at a precise position with respect to said microscope optical path as said input shaft rotates and translates;

whereby when said input shaft translates said first element moves into interference alignment with said second element to prevent said magnification changer shaft from indexing past its prescribed position.

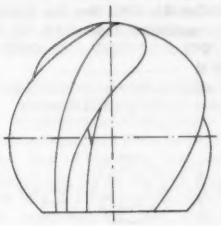
4,518,224

OMNIDIRECTIONAL REFLECTOR WITH HELICALLY TURNED SEGMENTS

Bertil Habro, 18, Roderstigen, S-181 43 Lidingö , Sweden

Filed Aug. 11, 1983, Ser. No. 522,345
Claims priority, application Sweden, Sep. 1, 1982, 8204992
Int. Cl.³ G02B 5/10
U.S. Cl. 350—606 11 Claims

1. A reflector having a central light source and adapted to provide a substantially even omnidirectional light distribution on a horizontal plane under the reflector, comprising a plurality of segments of reflective material arranged around the light source in fixed relation to each other and helically turned about the light source vertically, the segments at least substantially enclosing the light source and forming a body that is substantially symmetrical about a vertical axis of the reflector and that is open at the bottom of the reflector, the segments being disposed and oriented with respect to each other to provide successive reflective surfaces with space therebetween whereby light from the source may impinge upon the reflective surfaces and be reflected therefrom onto said horizontal plane.

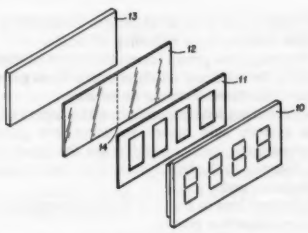


4,518,225

MULTICOLORED LIQUID CRYSTAL DISPLAYS UTILIZING PHOTOLUMINESCENT TRANSFLECTORS AND MASK

Lee R. Fredrickson; Michael R. Cascini, and Donald E. Mosier, all of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 11, 1983, Ser. No. 484,047
Int. Cl.³ G02F 1/133
U.S. Cl. 350—338 6 Claims



1. A liquid crystal display for an aircraft having a segmented display configuration in a first region having a segmented readout and having a second region comprising in combination:

a. a liquid crystal material having a dye with blue light attenuation characteristics in darkened portions thereof;

b. a photoluminescent transflector disposed in a spaced parallel relationship with said liquid crystal material;

c. a mask disposed interjacent said liquid crystal material and said transflector, forming a spacing means therein, and having a configuration conforming substantially with said second region of said display; and

d. a light source disposed on a side opposite said mask, whereby said liquid crystal material, said photoluminescent transflector, and said light source have coordinated emission characteristics.

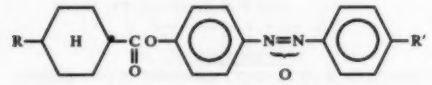
4,518,226

ESTER-AZOXY COMPOUNDS

Yoshio Shionozaki, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,985
Claims priority, application Japan, Oct. 20, 1982, 57-185150
Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *105/00*
U.S. Cl. 350—350 R **30 Claims**

1. P-(trans-4-alkylcyclohexylcarbonyloxy)-P'-alkylazoxybenzene represented by the general formula:



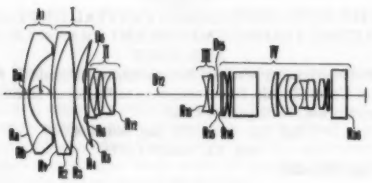
wherein R and R' are straight-chain alkyl groups having one to eight carbon atoms.

4,518,227

METHOD OF WIDENING THE ANGULAR FIELD OF A PHOTOGRAPHIC OBJECTIVE LENS

Akira Tajima, No. 267, Kamihirama Nakahara-ku, Kawasaki-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 586,259, Jun. 12, 1975, abandoned.
This application Mar. 27, 1978, Ser. No. 890,233
Claims priority, application Japan, Jun. 18, 1974, 46-69399
Int. Cl.³ G02B *15/10, 15/18*
U.S. Cl. 350—422 **8 Claims**



5. A wide field angle lens arrangement comprising:
a lens system formed by a plurality of lenses;
(a) a first focusing lens group formed of a part of lenses of the lens system for focusing an object on a focal plane from a predetermined close distance to infinity,
(b) a macro focusing lens group formed by a part of lenses of the lens system, said macro focusing lens group alone being operable to focus an object on the focal plane at a shorter distance to the lens system than the predetermined close distance, and
(c) an attachment lens in front of the lens system and having a negative refractive power,
said attachment lens for forming a virtual image of the predetermined object at a position nearer the lens system than the predetermined close distance,
said virtual image formed being focused on the focal plane by operation of the macro focusing lens group.

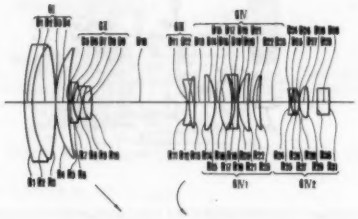
4,518,228

ZOOM LENS

Muneharu Sugiura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,670
Int. Cl.³ G02B *13/22, 15/18*
U.S. Cl. 350—427 **2 Claims**

1. A zoom lens having four lens groups from front to rear; a first lens group of positive refractive power for focusing, a second lens group of negative refractive power having an image magnification varying function, a third lens group of negative refractive power for compensating for the shift of an image plane resulting from the change of the image magnification, and a fourth lens group of positive refractive power having an image forming function;
said fourth lens group having from front to rear a first component lens group and a second component lens group;
said first lens group having five lenses from front to rear including a first lens having a strong refracting surface at the image side thereof with both the lens surfaces being convex surfaces, a second lens having a strong refracting surface at the object side with both the surfaces being convex surfaces, a third lens of negative refractive power having a strong refracting surface at the object side, a



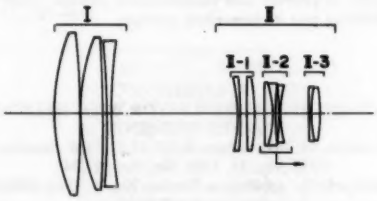
fourth lens of positive refractive power having a strong refracting surface at the object side, and a fifth lens of positive refractive power having a strong refracting surface at the object side; and said second component lens group having three lenses from front to rear including a first lens of negative refractive power having a strong refracting surface at the image side, a second lens of positive refractive power having a strong refracting surface at the image side with both the lens surfaces being convex surfaces, and a third lens of positive refractive power having a strong refracting surface at the object side with both the lens surfaces being convex surfaces.

4,518,229

TELEPHOTO LENS SYSTEM

Mitsuo Yasukuni, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1982, Ser. No. 365,268
Claims priority, application Japan, Apr. 6, 1981, 56-52120
Int. Cl.³ G02B *9/64, 13/02*
U.S. Cl. 350—454 **20 Claims**



1. A telephoto lens system comprising:
a front lens group of a positive refractive power fixed on the optical axis; and
a rear lens group of a negative refractive power consisting, from the object to the image side, of a first positive subunit fixed on the optical axis, a second negative subunit movable along the optical axis and a third positive subunit fixed on the optical axis, the second negative subunit being movable toward the image side for focusing to a close object.

4,518,230

UNIVERSAL BINOCULAR TUBE FOR MICROSCOPES

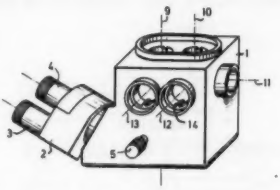
Klaus Weber, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheimon am Brenz, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,053

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203142

Int. Cl.[3] G02B *21/18, 27/10*

U.S. Cl. 350—511 9 Claims



1. An optical tube structure for use with a microscope to enable a beam of light from a microscope objective to be directed, alternatively, either (a) entirely to a binocular eyepiece, or (b) entirely to an auxiliary unit which will return a reflected beam back, with provision for directing said reflected beam to said eyepiece, or (c) partly to the eyepiece and partly to a camera, said structure comprising:

a hollow body having a plurality of outer walls including a first wall, a second wall, a third wall, and a front wall;

a binocular eyepiece mounted on said front wall;

said body being mountable on a microscope in such position that a light beam from an objective of said microscope will enter said body along a first optical axis substantially perpendicular to said first wall;

a first access opening (9) in said first wall and a second optical axis extending through said first opening;

a second access opening (10) in said first wall and a third optical axis extending through said second opening;

said second optical axis and said third optical axis being parallel to each other;

a third access opening (12) in said second wall and a fourth optical axis extending through said third opening;

a fourth access opening (13) in said second wall and a fifth optical axis extending through said fourth opening;

said fourth optical axis intersecting said third optical axis, and said fifth optical axis intersecting said second optical axis;

a fifth access opening (11) in said third wall and a sixth optical axis extending through said fifth opening;

said sixth optical axis intersecting the second, third, fourth, and fifth optical axes;

adjustable turret means having a plurality of prisms including a first prism (6), a second prism (7), and a third prism (8), said turret means being adjustable to position any selected one of said prisms at an effective operating position in said first optical axis; and

a fixed reflecting surface in said body;

said first prism (6) being movable by operation of said turret means to an effective position wherein all of a light beam entering said tube structure from a microscope objective along said first optical axis will be directed by said first prism to said eyepiece;

said second prism (7) being movable by operation of said turret means to an effective position wherein all of a light beam entering said tube structure along said first optical axis will pass through said second prism and exit from said tube structure along said second optical axis to an auxiliary unit (19, 27) mounted on said first wall and light reflected back by said auxiliary unit and entering said tube structure along said third optical axis will be directed by said fixed reflecting surface to a path leading to said eyepiece;

said third prism (8) being movable by operation of said turret means to an effective position wherein a light beam entering said tube structure along said first optical axis will be split by said third prism and part of the light in said beam will be directed by said third prism to said eyepiece and part of said light will exit from said tube structure along said second optical axis to an auxiliary unit (35) mounted on said first wall.

4,518,231

STEREOMICROSCOPE

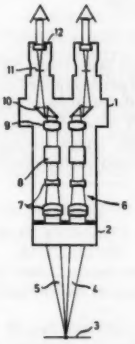
Franz Muchel, Königsbronn, and Fritz Strähle, Heubach-Lautern, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,583

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217776

Int. Cl.[3] G02B *13/10, 21/02, 21/22*

U.S. Cl. 350—516 6 Claims



1. A stereomicroscope having two parallel conducted observation channels behind an objective assembly, said objective assembly comprising

(a) two individual objectives having respective optical axes which are inclined with respect to each other and with respect to said parallel channels,

(b) two prism assemblies to compensate for the inclination of said optical axes of said objectives with respect to said parallel channels, and

(c) a common housing containing said two objectives and said two prism assemblies, said common housing forming a replaceable and interchangeable part of said stereomicroscope,

(d) each of said two prism assemblies including at least two cemented refractive wedge prism elements, one of said prism assemblies being mounted in operative relation to each of said objectives.

4,518,232

METHOD AND APPARATUS FOR OPTICAL BEAM SHAPING

Dominique M. Dagenais, Wellesley Hills, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Aug. 24, 1983, Ser. No. 525,868

Int. Cl.[3] G02B *5/10*

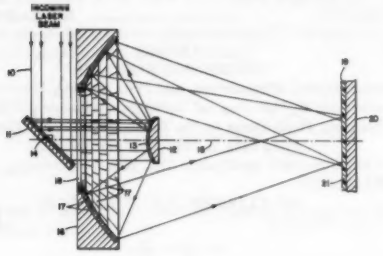
U.S. Cl. 350—620 10 Claims

1. Apparatus for optically modifying a laser beam to provide at an image plane a modified final image having predetermined shape, dimension and energy distribution comprising:

(a) paraboloid mirror means for receiving a laser beam and reflecting it, said mirror means having a first focal point disposed and substantially uniformly divergently reflecting said laser beam concentrically as if it emanated from said focal point; and

(b) a plurality of small flat mirrors for collectively receiving

substantially all of said laser beam reflected from said paraboloid mirror means, each said flat mirror having a shape substantially the same as that of said final image and reflecting a small portion of the laser beam to said image plane concentric about a center point in said image plane,



the portion of said laser beam reflected from each flat mirror having said predetermined dimensions and shape at said image plane, the portions of said laser beam reflected by said flat mirrors combining at said image plane to form said modified final image having said predetermined shape, dimensions and energy distribution.

4,518,233

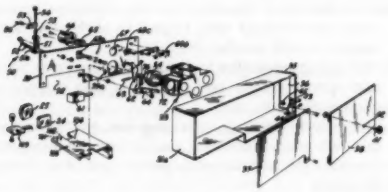
AUTOMATIC LAMP CHANGER FOR MODULAR SLIDE PROJECTOR

Kenneth LiDonnici, and Angelo Dituri, both of Valley Stream, N.Y., assignors to General Audio-Visual Inc., Valley Stream, N.Y.

Continuation of Ser. No. 459,733, Jan. 20, 1983, abandoned. This application Dec. 21, 1983, Ser. No. 564,349

Int. Cl.³ G03B *21/20*

U.S. Cl. 353—87 **2 Claims**



1. A lamp changer for use with a slide projector having a projection lens and a removable modular projection lamp unit insertable through an access opening, the lamp changer replacing said modular projection lamp unit during use, said lamp changer comprising:

a housing;

means for releasably connecting the housing to the projector at the access opening;

lamp holding means for holding at least two projection lamps;

means mounting the lamp holding means in the housing for pivotable movement about a first axis to successively position each lamp in the lamp holding means in direct alignment with the projection lens;

means for effecting movement of the lamp holding means when desired and for energizing the new lamp moved into alignment with the lens; and a cylindrical tunnel aligned with the lens and abutting the lamp holding means and extending through the housing to isolate air heated by an energized lamp, said tunnel stationarily connected to said housing.

4,518,234

METHOD AND APPARATUS FOR REPRODUCING AT LEAST ONE COLORED SURFACE

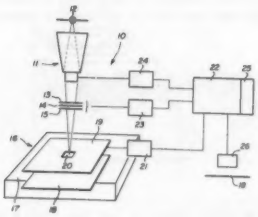
Jean-Claude Lamére, Villaret, 1411 Esserttines sur Yverdon, Switzerland

Filed Nov. 30, 1983, Ser. No. 556,432

Claims priority, application Switzerland, Jan. 10, 1983, 109/83

Int. Cl.³ G03B *27/00, 41/00*

U.S. Cl. 354—20 **11 Claims**



1. Method for reproducing at least one colored surface, the color of which corresponds to a reference chosen from a color chart, said colored surface being obtained by controlled synthesis of colors on a given photographic emulsion, characterized by the fact that during a first stage there is recorded, on a photographic emulsion of the same type, a sensitogram developed with developing materials of predetermined characteristics, a densitometric analysis of said developed sensitogram is made and the results thereof recorded so as to establish an analytical record of the colors comprising the sensitogram respecting the photographic emulsion and the developing materials used, and by the fact that during a second stage, the exposure conditions for the photographic emulsion are determined to reproduce the color selected from the color chart as a function of the information retained in the analytical record of the colors of the sensitogram.

4,518,235

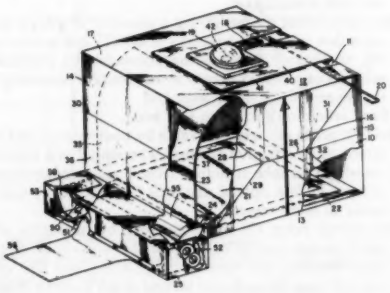
COLLAPSIBLE DISPOSABLE CAMERA

Richard K. Reed, Pendleton; James R. Reed, Indianapolis, both of Ind., and James D. Sorg, 1709 Queensbridge Dr., Indianapolis, Ind. 46219, assignors to James D. Sorg, Indianapolis, Ind.

Filed Feb. 6, 1984, Ser. No. 577,491

Int. Cl.³ G03B *17/52*

U.S. Cl. 354—86 **16 Claims**



1. A disposable camera comprising:

a camera box having an aperture and being moveable between a collapsed position and an erected position;

a lens mounted over said aperture;

shutter means mounted to said box adjacent said aperture

and operable to open and close said aperture allowing light therethrough;

photographic paper within said box;

photographic negative within said box having a light developable surface facing said aperture; and,

first guide means mounted within said box and engaged with said photographic paper operable to position said paper in a flat, uncreased condition adjacent said light developable surface and between said aperture and said surface when in said collapsed position and to move said paper away from said surface allowing an unobstructed view from said aperture to said surface when in said erected position.

4,518,236

Patent Not Issued For This Number

4,518,237

INDICATOR FOR PROPER OR IMPROPER EXPOSURE BY AUTOMATIC ELECTRONIC FLASH

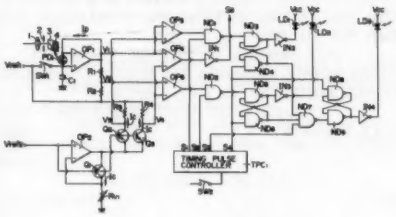
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,563

Claims priority, application Japan, Apr. 30, 1982, 57-72948

Int. Cl.³ G03B *15/02*

U.S. Cl. 354—127.1 **13 Claims**



1. An indicator for proper or improper exposure provided by automatic electronic flash, comprising:

means including a first comparison means for producing an emission terminate signal when an amount of exposure provided by light reflected from an object being photographed has reached a proper exposure level which is adjusted to correspond to a preset film speed;

a first decision circuit including a second comparison means and having a first decision level which is lower than the decision level corresponding to the proper exposure level;

a second decision circuit including a third comparison means and having a second decision level higher than the decision level corresponding to the proper exposure level said proper decision level being intermediate said first and second decision levels so that the difference between the first decision level and the proper decision level is greater than 0.1 Ev;

means for displaying an overexposure in response to an output from the second decision circuit at a given time interval after the initiation of emission of flashlight from an automatic electronic flash;

means for displaying an underexposure in response to an output from the first decision circuit at a time interval after the initiation of emission flashlight from the automatic electronic flash, the time interval corresponding to the time required for full emission of flashlight from the electronic flash;

and means for displaying a proper exposure in response to outputs from the first and the second decision circuits.

4,518,238

ROTATION CONTROL MECHANISM FOR DIAPHRAGM-OPERATING RING IN INTERCHANGEABLE OBJECTIVE FOR PHOTOGRAPHIC CAMERA

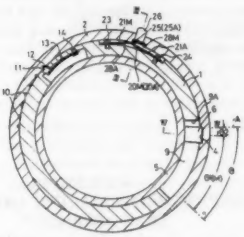
Yoshihiro Hama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,723

Claims priority, application Japan, Aug. 18, 1982, 57-124728[U]

Int. Cl.³ G03B *9/02*

U.S. Cl. 354—270 **7 Claims**



1. An interchangeable objective with a variable lens aperture for a camera comprising:

a stationary support member;

a diaphragm-operating member rotatable about an axis between first and second angular positions relative to the stationary member;

a first elongated leaf spring mounted on the stationary member to bear against the diaphragm-operating member along a first plane perpendicular to the axis;

a second elongated leaf spring mounted on the stationary member to bear against the diaphragm-operating member along a second plane perpendicular to the axis, the second plane being spaced from the first plane in the direction of the axis;

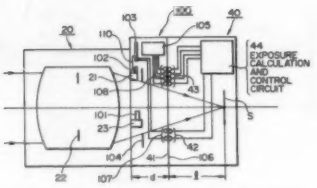
locking groove means formed in the diaphragm-operating member so as alternately to receive the first and secon' leaf springs in locking engagement when the diaphragm-operating member is positioned at the first and second angular positions, respectively; and

an unlocking button mounted in the diaphragm-operating member over the locking groove means to push the respective first and second leaf springs out of engagement with the locking groove means upon depression of the locking button.

4,518,239
INTERMEDIATE ADAPTER FOR CAMERA

Yasumasa Tomori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,287
Claims priority, application Japan, Jun. 2, 1983, 58-98624
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—286 **8 Claims**



1. An intermediate adapter for a camera for coupling an interchangeable lens having a small flange focal distance to a camera body having a large flange focal distance, comprising:

an aperture device replacing a stop of said interchangeable lens and driven by an electric motor;

aperture value data transmitting means for transmitting aperture value data set by an aperture value setting member provided for said interchangeable lens to said aperture device;

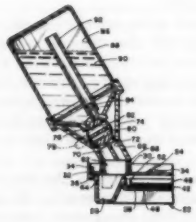
aperture opening degree regulating means for regulating an aperture opening degree to a set aperture value according to said aperture value data thus transmitted in an aperture driving operation performed by said electric motor; and

video changeover means for releasing said aperture opening degree regulating means to allow said aperture device to operate in a range of a fully open state to a fully closed state.

4,518,240
PHOTOGRAPHIC PRINT MAKING AND DEVELOPING TRAY ASSEMBLY

Charles E. Taylor, Westlake Village; Stanley A. Wnukiewicz, Jr., Woodland Hills, and Anton Gattiker, Playa Del Ray, all of Calif., assignors to Phase One Products Corporation, Westlake Village, Calif.

Filed Jul. 25, 1983, Ser. No. 516,929
Int. Cl.³ G03B *3/06, 13/04*
U.S. Cl. 354—312 **12 Claims**



1. A photographic print making and developing tray comprising:

a tray housing formed of a bottom wall and a side wall located about the periphery of said bottom wall, said side wall enclosing an internal chamber, the uppermost edge of said sidewall forming an access opening, engaging means connected to said sidewall assembly at said access opening, said internal chamber being divided into a planar section and an elongated channel;

a cover to connect in a closed position with said engaging means in a light-tight manner, said cover being slidably movable to an open position permitting unrestricted access into said planar section;

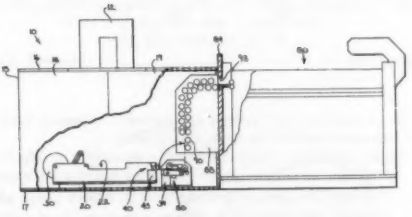
an aperture formed within said cover, connecting means surrounding said aperture, said aperture being adapted to pass a liquid into said elongated channel with said cover in said closed position, upon said tray housing being sufficiently tipped the liquid is caused to come into contact with said planar section substantially covering such; and

a container adapted to contain the liquid, said container having a spout, a passage assembly formed within said spout, said spout to removably connect in a liquid tight manner with said connecting means to permit the liquid to flow through said passage into said elongated channel of said tray housing.

4,518,241
INSTALLATION FOR SUPPLYING PHOTOGRAPHIC EMULSION CARRIERS TO A DEVELOPING MACHINE

Heinrich Huss, Liebigstrasse 1, 6054 Rodgau 6, Fed. Rep. of Germany

PCT No. PCT/EP82/00206, § 371 Date May 18, 1983, § 102(e) Date May 18, 1983, PCT Pub. No. WO83/01126, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 18, 1982, Ser. No. 499,151
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 8127303[U]; Feb. 18, 1982, 3205739
Int. Cl.³ G03D *13/00;* G03B *27/58*
U.S. Cl. 354—319 **13 Claims**



1. Apparatus for transferring photographic carrier sheets (**24**) from an exposure easel (**22**) into an elongate input slot (**87**) of a developing machine (**80**) that extends transversely to the direction of feed, comprising:

a carriage (**63**) movable along said input slot (**87**) between an initial position for receiving a carrier sheet (**24**) from said easel (**22**) and a predetermined transfer position for transferring a carrier sheet (**24**) to said input slot (**87**);

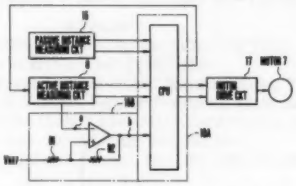
carriage drive means (**140**) for moving said carriage (**63**) between said positions; and

control means (**120**) for controlling said drive means (**140**) to selectively move said carriage (**63**) to a plurality of transfer positions in response to a preselected carrier sheet format signal.

4,518,242
AUTOMATIC FOCUS ADJUSTING DEVICE

Masamichi Toyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 650,305
Claims priority, application Japan, Sep. 13, 1983, 58-170386
Int. Cl.³ G03B 3/00
U.S. Cl. 354—403 2 Claims

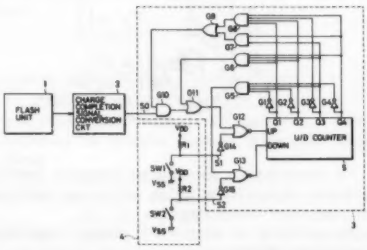


1. An automatic focus adjusting device comprising:
(a) a focusing lens;
(b) lens drive means for moving said focusing lens;
(c) first distance measuring means including light emitting means for producing a distance measuring light on an object to be photographed, and light receiving means receptive of a reflection of said distance measuring light from the object for producing a received light signal corresponding to amount of reflected light;
(d) second distance measuring means including a detector receptive of reflection of natural light or indoor light from the object for detecting and generating an output of the distance of said focusing lens from an in-focus position, or an out-of-focus amount; and
(e) selecting means for receiving said received light signal and the output of said detector and selecting operation of said first or second distance measuring means on the basis of either one of said signals.

4,518,243
SHUTTER SPEED SETTING DEVICE FOR CAMERA

Takeo Kobayashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Sep. 9, 1983, Ser. No. 530,836
Claims priority, application Japan, Sep. 10, 1982, 57-136578[U]
Int. Cl.³ G03B 7/00, 15/05
U.S. Cl. 354—418 5 Claims

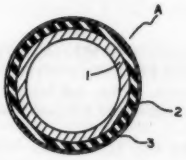


1. A shutter speed setting device for a camera comprising:
a signal generator for providing an output corresponding to the setting of a shutter speed to be set;
a shutter speed setting circuit for providing a signal corresponding with a shutter speed in response to an output from said signal generator;
a flash unit connected to said shutter speed setting circuit and controlled with a shutter speed equivalent to a flash synchronization speed;
a charge completion signal conversion circuit for converting into a predetermined signal a charge completion signal from said flash unit which represents whether or not said flash unit is ready for use;
wherein, when said flash unit is ready for use and said charge completion signal is provided and a preset shutter speed is higher than the flash synchronization speed, said shutter speed can be set to speeds lower than said preset shutter speed, including shutter speeds higher than said flash synchronization shutter speed, and when said preset shutter speed is lower than the flash synchronization speed, a new shutter speed can be set as desired, either lower than said preset shutter speed or higher than said preset shutter speed until said new shutter speed reaches the flash synchronization speed.

4,518,244
HEAT FIXER ROLL WITH AN EVAPORATED METAL SURFACE

Katsuaki Kageyama, and Ysushi Adachi, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,744
Claims priority, application Japan, Oct. 29, 1981, 56-173252
Int. Cl.³ G03G 15/20
U.S. Cl. 355—3 FU 5 Claims

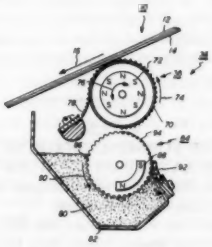


1. A heat fixer roll suitable for use in a dry type electric photocopying machine comprising a cylindrical hollow roll body whose outer surface is covered with a heat-resistant rubber layer having a thickness in the range of from 0.5 to 2 millimeters and an evaporated metal layer having a thickness in the range of 10^{-8} and 5×10^{-7} meters covers the heat-resistant rubber layer.

4,518,245
DEVELOPMENT SYSTEM USING A THIN LAYER OF MARKING PARTICLES

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1983, Ser. No. 478,425
Int. Cl.³ G03G 15/09
U.S. Cl. 355—3 DD 32 Claims



1. An apparatus for developing a latent image recorded on an image receiving member, including:

a housing defining a chamber for storing a supply of marking particles;

means for transporting the marking particles into contact with the latent image recorded on the image receiving member, said transporting means comprising a tubular member and an elongated magnetic member disposed interiorly of and spaced from said tubular member for attracting the marking particles to the surface of said tubular member;

means for removing marking particles from said tubular member after the marking particles contact the latent image;

means, closely spaced to said tubular member, for advancing the marking particles from the chamber of said housing to said tubular member, said advancing means comprising a metering tube having a plurality of spaced depressions in the exterior surface thereof for receiving the marking particles therein and a metering magnet disposed interiorly of and spaced from said metering tube for attracting marking particles from the chamber of said housing to said metering tube, said tubular member forming a layer of marking particles having a thickness which is a function of the ratio of the surface velocity of said metering tube to the surface velocity of said tubular member; and

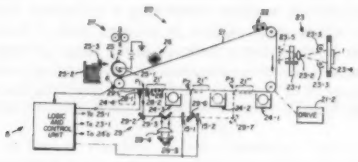
means for regulating the quantity of marking particles being advanced by said metering tube to said tubular member.

4,518,246

APPARATUS AND METHOD FOR FORMING MULTICOLOR ELECTROPHOTOGRAPHIC IMAGES

Jerome G. Spitzner, Byron, and Michael D. Stoudt, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 12, 1983, Ser. No. 493,867
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—4 **50 Claims**



1. An electrophotographic color imaging apparatus comprising a plurality of photoconductor image sectors, means for forming a plurality of different electrostatic color-separation images respectively on different image sectors, means for developing such different electrostatic images respectively with different color toner and masking means for reflecting light from the toner image on one developed photoconductor image sector, in register, to the electrostatic color-separation image on an undeveloped photoconductor image sector, whereby portions of the undeveloped sector are discharged in proportion to the toner density on their corresponding portions of the developed sector.

4,518,247

APPARATUS FOR FORMING IMAGE BY DEVELOPING CHARGE LATENT IMAGE WITH TONER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,702
Claims priority, application Japan, Jun. 11, 1982, 57-99346
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—15 **6 Claims**

1. An apparatus for forming an image by developing an electrostatic charge latent image with a toner comprising

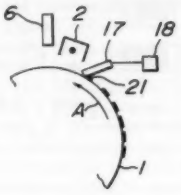
means including an electrostatic charge retentive member arranged rotatably;

means for forming an electrostatic charge latent image on the charge retentive member;

means for developing the charge latent image with a toner to form a toner image on the charge retentive member;

means for transferring the toner image onto a record paper;

means having a cleaning blade selectively brought into contact with the charge retentive member for collecting a



residual toner on the charge retentive member after transferring the toner image on the record paper to form a toner accumulation; and

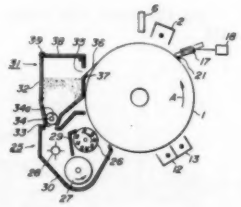
means for separating the cleaning blade from the charge retentive member at a timing determined by a length of the record paper to allow a passage of the toner accumulation underneath the cleaning blade; whereby the toner accumulation is transported to the developing means as the charge retentive member continues to rotate and is collected by the developing means for the recovery.

4,518,248

APPARATUS FOR FORMING IMAGE BY DEVELOPING CHARGE LATENT IMAGE WITH TWO COMPONENT DRY DEVELOPING AGENT

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,703
Claims priority, application Japan, Jun. 10, 1982, 57-98409
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—15 **11 Claims**



1. An apparatus for forming an image by developing an electrostatic charge latent image with a two component dry developing agent comprising

means including an electrostatic charge retentive member arranged rotatably;

means for forming an electrostatic charge latent image on the charge retentive member;

means for developing the charge latent image with a two component dry developing agent to form a toner image on the charge retentive member and having a toner hopper for storing a toner;

means for transferring the toner image onto a record paper;

means having a cleaning blade selectively brought into contact with the charge retentive member for collecting a residual toner remained on the charge retentive member

after transferring the toner image onto the record paper to form a toner accumulation;

means for separating the cleaning blade from the charge retentive member to allow a passage of the toner accumulation underneath the cleaning blade; and

means for removing the toner accumulation from the charge retentive member into the toner hopper of the developing means.

4,518,249

SLIT ILLUMINATION SYSTEM FOR COPYING MACHINE AND THE LIKE

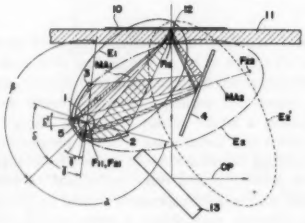
Tomoji Murata, Toyokawa; Masamichi Hayashi, Aichi; Yasuo Goto, and Seiichi Sakurai, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1983, Ser. No. 552,243

Claims priority, application Japan, Nov. 30, 1982, 57-210368

Int. Cl.³ G03B *27/54*

U.S. Cl. 355—67 **19 Claims**



1. A slit illumination system for use in a copying machine or the like comprising; a light source,

first elliptical mirror directing the light from the light source to an original and positioned on one side of an optical path for an image corresponding to the original and between the light source and the optical path,

a second elliptical mirror positioned on the same side of the optical path as the first mirror and farther than the first mirror with respect to the optical path and directing the light from the light source to the original through a third mirror positioned on the other side of the optical path, and

a supplemental mirror positioned behind the light source and between the first and second mirrors for illuminating the original through a light path extending directly to the original and/or a light path extending to the original through the third mirror.

4,518,250

EXPOSURE CONTROL DEVICE FOR A PHOTOGRAPHIC ENLARGER

Yoshio Yuasa, Osaka, and Nobukazu Kawagoe, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1984, Ser. No. 570,175

Claims priority, application Japan, Jan. 12, 1983, 58-2834[U]

Int. Cl.³ G03B *27/70*

U.S. Cl. 355—69 **15 Claims**

1. An improved exposure control device for printing photographic prints comprising:

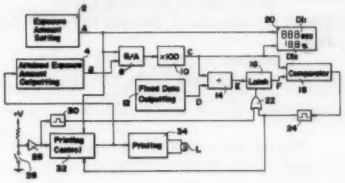
means for setting a predetermined exposure amount to output a signal corresponding to said exposure amount;

means for activating the exposure printing;

means for measuring the accumulated exposure from the start of the printing operation and providing a current exposure signal;

means for calculating a relationship between the predetermined exposure amount signal and the current exposure signal, and

means for periodically suspending the exposure printing in response to predetermined calculated relationships



whereby a user can alter the contrast of the print prior to the continuance of the printing process.

4,518,251

APPARATUS FOR HANDLING SHEETS FOR MICROFILMING OR OTHER SIMILAR RECORDING

Ingemar Larsson, Hjortrongränd 39, S-182 45 Enebyberg, Sweden

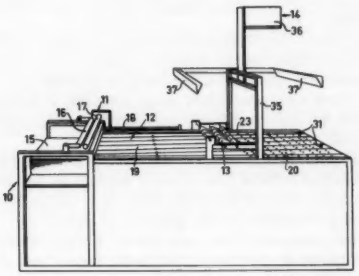
PCT No. PCT/SE82/00267, § 371 Date Apr. 20, 1983, § 102(e) Date Apr. 20, 1983, PCT Pub. No. WO83/00748, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 20, 1982, Ser. No. 491,965

Claims priority, application Sweden, Aug. 20, 1981, 8104948

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **10 Claims**



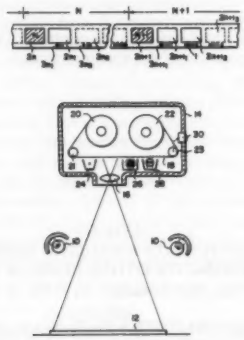
1. An apparatus for handling unperforated sheets for microfilming or other similar recording, including a conveyor path (**12**) fed step-by-step, a positioning portion (**19**) on the conveyor for positioning a sheet in a flat state on the conveyor, an exposure table (**20**) with a plane surface arranged in the conveying direction after said positioning portion, and a microfilm camera or other equipment for digitalation or reading arranged above the exposure table, characterized in that said exposure table (**20**) is provided with parallel slots (**28**) open through the table surface (**27**) facing the camera and extending in the conveying direction; that said conveyor path (**12**) runs below said table surface (**27**) and is provided with sheet drivers (**22**) projecting above said table surface and running in said slots (**28**), said sheet drivers (**22**) being arranged in rows extending crosswise the conveying direction and with a distance between adjacent rows at least equal to the extension of a sheet in the conveying direction; and that positioning means (**23**) is arranged for correct positioning of said unperforated sheets during the microfilming or other similar recording operations.

4,518,252

METHOD OF RECORDING PIECES OF IMAGE INFORMATION OF DIFFERENT KINDS IN ELECTROPHOTOGRAPHY

Shuichi Ohtsuka, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 8, 1982, Ser. No. 433,626
Claims priority, application Japan, Oct. 19, 1981, 56-166793
Int. Cl.³ G03G *13/22*
U.S. Cl. 355—133 4 Claims



1. A method of permanently recording and classifying pieces of image information of different kinds according to their kinds on a single recording medium of rollfilm for intermittent image information retrieval and image information supplementation comprising,

providing an electrophotographic photosensitive rollfilm of predetermined length having a plurality of sequential frames thereon, said rollfilm being activatable in a frame-by-frame manner to record image information thereon and when not activated being unaffected by information retrieval;

demarcating the full length of the electrophotographic photosensitive rollfilm into as many sections as the kinds of image information to be recorded, each said section containing a sequence of said plurality of frames; and

recording sequentially as many pieces of image information as required at one time on proper sections of said rollfilm according to their kinds, each section corresponding to one of said kinds of image information, said recording step comprising

charging at least one frame of said electrophotographic photosensitive rollfilm with electricity to activate said frame for recordation of image information, said frame belonging to a section which is allotted to the kind of image information to be recorded,

exposing the frame to the image of a pattern representing the piece of image information, to form an electrical image on said rollfilm,

developing the so-formed electrical image of the pattern with toner, to form a toner image, and

permanently fixing said toner image on said frame of said rollfilm,

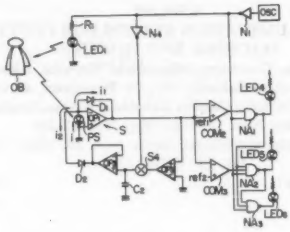
whereby image information can be permanently recorded on said rollfilm and classified at the time of recordation according to the kind of image information for rapid retrieval of image information and said image information can be retrieved without affecting the ability of the rollfilm to record additional image information.

4,518,253

DISTANCE MEASUREMENT SYSTEM

Akira Takahashi, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,736
Claims priority, application Japan, Mar. 19, 1980, 55-035328
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—4 5 Claims



1. A camera having a range detection system for determining whether an object to be photographed with said camera is within a predetermined distance from said camera, said camera comprising means for emitting energy towards said object, means including a single sensor receiving energy reflected from said object and developing a signal proportional to the intensity of energy received thereby, means for comparing said signal with a predetermined reference signal for producing a control signal, and means responsive to said control signal for determining whether said object is either within a predetermined range of said camera or beyond said predetermined range of said camera, said emitting means being operable intermittently, and said determining means including an element responsive to said energy land adapted to generate a level of current proportional to the intensity of energy received thereby, means operable when said emitting means is not operating for establishing the background level of current proportional to the intensity of energy received by said responsive element when said emitting means is not operating, means for draining said background level of current from said responsive element when said emitting means is operating to generate a current signal proportional to the intensity of the transmitted energy reflected by said object, and comparing means for comparing said current signal with a reference signal to activate said indicator means.

4,518,254

OCEAN DEPTH SOUNDING FROM THE AIR BY LASER BEAM

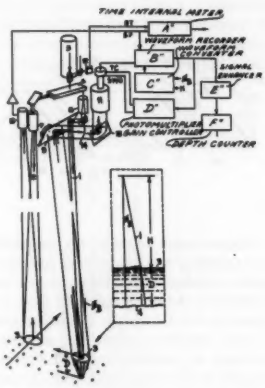
Michael F. Penny, Salisbury Heights; Brian Woodcock, Banksia Park; Ralph H. Abbot, Walkerville; David M. Phillips, Tea Tree Gully, and Leendert B. Spaans, Hawthorndene, all of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU81/00137, § 371 Date May 18, 1982, § 102(e) Date May 18, 1982, PCT Pub. No. WO82/01075, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 21, 1981, Ser. No. 385,398
Claims priority, application Australia, Sep. 22, 1980, PE5680/80
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—5 22 Claims

1. The method of ocean depth sounding from the air by laser beam which comprises the following steps:

(a) directing two laser beams of different wavelengths downwardly from an aircraft, one a beam in the green spectrum traversed laterally across the flight path of the aircraft to detect the ocean bottom, the other a vertical stable beam in the infrared spectrum to detect the ocean surface

(b) receiving the reflected infrared surface signal and the reflected green ocean bottom signal in separate-receivers,
(c) processing the data from the red beam reflections to determine ocean surface distance and to generate a timing datum for depth measurement,



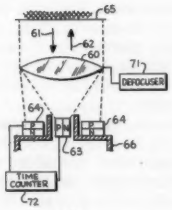
(d) adjusting the dynamic range of the green receiver, for optimum reception of the bottom return signal which decreases exponentially in amplitude with increasing depth, and
(e) processing the data from the green beam to determine the ocean depth by measuring the differential time between the two reflected signals.

4,518,255

TEMPERATURE TRACKING RANGE FINDER

Rainer Zuleeg, San Juan Capistrano, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 20, 1982, Ser. No. 410,015
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—5 **13 Claims**



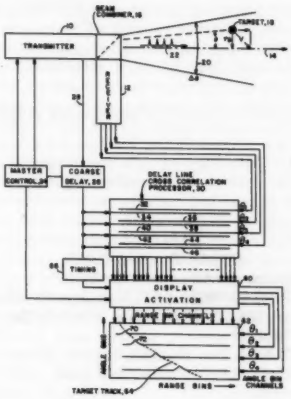
1. Apparatus to find the range to a target, comprising:
means for emitting pulsed, coherent photon energy directed toward the target, wherein the wavelength of the emitted pulse varies directly with the temperature of said emitter means comprising a Gallium Arsenide injection laser diode;
means for detecting a reflected pulse of said photon energy traveling from the target functionally separate from said emitter means, wherein the peak spectral response of said detecting means substantially matches the peak spectral emission of said emitting means with varying temperatures within an effectively narrow band of wavelengths comprising a narrow band self-filtering Gallium arsenide electroabsorption avalanche photodiode detector;
time counter means for measuring the elapsed time between the emission of the emitted pulse and the detection of the reflected pulse, and
range calculating means to convert the elapsed time measure to a distance measure response.

4,518,256

ENHANCED ACCURACY OPTICAL RADAR

Jacob Schwartz, Arlington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 23, 1977, Ser. No. 799,827
Int. Cl.³ G01C *3/08, 1/00;* G01P *3/36;* G01B *11/26*
U.S. Cl. 356—5 **9 Claims**



1. An optical radar comprising:
means for projecting a pulsed burst towards a target;
means for receiving the pulsed burst as reflected by a target, said receiving means including a sectored receiver for dividing up the field of view of the receiver into angular segments; and,
oppositely directed delay line cross correlation means coupled to the projecting and receiving means for providing vernier range indications of the target, said oppositely directed delay line cross correlation means including pairs of oppositely directed delay lines, each delay line pair processing signals retained from a target within a different angular segment.

4,518,257

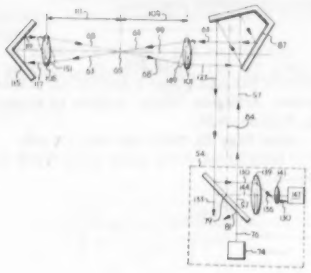
OPTICAL INSPECTION SYSTEM AND METHOD

Charles W. Donaldson, Blanchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 28, 1982, Ser. No. 402,681
Int. Cl.³ G01B *11/14*
U.S. Cl. 356—375 **16 Claims**

1. Apparatus for measuring a dimension of an object comprising:
(a) means for projecting a beam of light through an examination zone,
(b) means for inverting said beam of light and for returning said beam of light through said examination zone,
(c) detection means for producing a detection signal which indicates the degree of diminution of light passing through said examination zone, the diminution of the light being caused by the object's entering the examination zone,
(d) object-position means for generating a position signal from which the position of a predetermined point on said object can be derived,
(e) means coupled both to said object position means and to

said detection means for determining the distance between the point on said object and said detection point when the



degree of diminution of said light reaches a predetermined level.

4,518,258

COLOUR ANALYSER

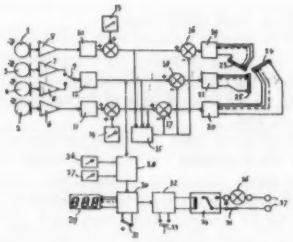
Harmen Broersma, Amsterdam, Netherlands

PCT No. PCT/NL80/00033, § 371 Date Jun. 19, 1981, § 102(e) Date Jun. 19, 1981, PCT Pub. No. WO81/01203, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 15, 1980, Ser. No. 276,365

Int. Cl.³ G01N *21/25;* G01J *1/42, 1/44*

U.S. Cl. 356—405 **1 Claim**



1. A colour analyser for measuring the relative intensities of a plurality of frequency components of light, comprising:

sensor means for simultaneously developing a plurality of signals respectively proportional to the intensities of a plurality of frequency components of light;

means operative on said proportional signals for determining which one represents the frequency component having the least intensity and for subtracting that one signal from at least each of the other ones of said proportional signals;

display means for simultaneously displaying the results of said subtractions;

additional circuitry that converts one or more signals of the analyser automatically into an indication of an exposure time needed to properly expose photosensitive materials; and

regulator means for permitting an operator to program said conversion for photosensitive materials having different reciprocity characteristics, said regulating means including means for setting the quotient of the logarithm of a measured light intensity divided by the logarithm of said exposure time to at least two different values, namely 1.0 and 1.2.

4,518,259

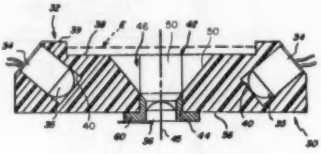
LIGHT GUIDE REFLECTOMETER

John W. Ward, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,754

Int. Cl.³ G01N *21/47*

U.S. Cl. 356—446 **13 Claims**



1. In a reflectometer adapted for measuring non-uniform distribution of density and comprising source means for generating radiation suitable to illuminate a test element, detector means for detecting radiation reflected from such test element, and one piece molded housing means in which said source means and said detector means are mounted, said housing means including as portions integral therewith, means for predeterminedly positioning such test element and optically transmissive radiation guide means constructed to guide said radiation from said source means to be positioned test element,

the improvement wherein (i) said source means includes means for at least partially collimating said illuminating radiation,

(ii) said radiation guide means includes an internally reflective surface constructed and located to direct said beam to illuminate a selected portion of a positioned test element, and

(iii) said detector means is located with respect to said positioning means, said source means and said reflecting surface so that the test element is illuminated by a whole spot of light that is disposed approximately centered above said detector means, and said detector means receives from an illuminated test element only radiation diffusely reflected from the illuminated test element.

4,518,260

APPARATUS FOR BLENDING SOLIDS OR THE LIKE

Robert R. Goins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 26, 1983, Ser. No. 526,845

Int. Cl.³ B01F *5/00, 15/02*

U.S. Cl. 366—134 **17 Claims**

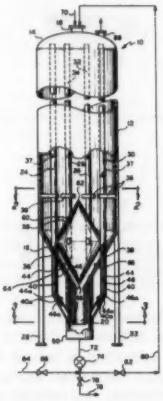
1. Solids blending apparatus comprising:

a vessel having an upper region, a lower region, a solids inlet in said upper region thereof and solids outlet means in said lower region thereof, the lower region being defined by a downwardly converging generally frustoconically shaped bottom wall;

a plurality of conduits each positioned within said vessel so as to extend in a generally vertical direction downwardly from said upper region through said lower region and through said bottom wall, at least one of said conduits containing at least one longitudinally extending divider means for dividing said conduit into a plurality of longitudinally extending compartments, at least a portion of said compartments having at least one first opening therein in said upper region to permit solids in said upper region to enter the conduit and flow by gravity downwardly through said compartments, and each of said compartments of at least one of said conduits extending downwardly from said upper region through said lower region and through and below said bottom wall;

connecting conduit means communicating between the lower end of each of said conduits and said solids outlet

means for conveying solids by gravity therethrough from each of said conduits to said solids outlet means, at least one of said connecting conduit means containing connecting divider means connected at the upper end thereof to the lower end of a corresponding longitudinally extending divider means for dividing said connecting conduit means into a plurality of extensions of said compartments communicating with and extending from the lower ends of the corresponding compartments at least a substantial distance toward said solids outlet means to permit solids flowing



downwardly through said compartments to continue to flow by gravity downwardly through said extensions of said compartments and said first connecting conduit means into said solids outlet means; and

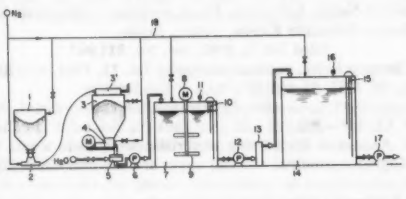
first drain conduit means communicating between a corresponding first one of said compartments and a corresponding first opening in said bottom wall intermediate said upper region and said solids outlet means for conveying solids by gravity therethrough from a location in said lower region to said corresponding first one of said compartments.

4,518,261

EQUIPMENT FOR DISSOLVING POLYACRYLAMIDE POWDER FOR OBTAINING AN AQUEOUS SOLUTION THEREOF FOR ENHANCED OIL RECOVERY

Yukihiko Sekimoto, Fujimi, and Osamu Okamoto, Tokyo, both of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,884
Claims priority, application Japan, Mar. 31, 1982, 57-52554
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—150 **1 Claim**



1. An equipment for dissolving polyacrylamide powder to obtain an aqueous solution thereof for enhanced oil recovery which comprises the following equipment units (A) through (K):

(A) a first powder storage tank for storing polyacrylamide powder under a nitrogen atmosphere;

(B) a second powder storage tank for storing polyacrylamide powder under a nitrogen atmosphere;

(C) a gas conveyor device for carrying the polyacrylamide powder from the first storage tank to the second storage tank by nitrogen gas flow;

(D) a constant powder supply device connected to receive the polyacrylamide powder supplied from the second storage tank, meter the powder, and discharge the powder, said constant powder supply device comprising a vertical cylinder for receiving the powder, a bottom plate which closes the bottom portion of the cylinder and has an opening portion to allow discharge of a small amount of the powder, a partition plate having an opening portion to allow falling of a small amount of the powder which partition plate is disposed within the cylinder parallel to the bottom plate and over the bottom plate, a driving shaft disposed coaxially in the central portion of the cylinder through the bottom plate and the partition plate, a plurality of radial division plates fixed to the driving shaft in the cylindrical space defined by the bottom plate and the partition plate and designed to rotate in sliding contact with the upper surface of the bottom plate and the lower surface of the partition plate as well as the inner surface of the cylinder, and a rotary powder agitation vane fixed to the driving shaft at the upper portion of the partition plate within the cylinder, the opening portion of the bottom plate for discharging the powder and the opening portion of the partition plate for allowing falling of the powder being disposed apart from the driving shaft, the shapes and positions of these opening portions being so designed that these opening portions do not lie one over another in the vertical direction, communication between these portions being prevented by the division plates;

(E) a powder dispersion device for dispersing in water the polyacrylamide powder discharged from the discharging opening portion of the bottom plate of the constant powder supply device, said powder dispersion device comprising a vessel, a water supply pipe connected to a side portion of the vessel for sending water under pressure into the vessel, a powder supply pipe connected to the upper portion of the vessel for supplying the powder into the vessel, a powder and water discharge pipe having a funnel-shaped inlet disposed a suitable height from the bottom portion of the vessel and being installed coaxially with the powder supply pipe, and an overflow pipe connected to the vessel for discharging water supplied in excess, the vessel and the water supply pipe being so designed that water whirls around the discharge pipe within the vessel, and means for adding additional water under pressure comprising an annular room surrounding the discharge pipe at a location downstream from the funnel-shaped inlet thereof, and another water supply pipe connected to the annular room to supply water under pressure in the tangential direction into the annular room, the discharge pipe having continuous or discontinuous spaces bored therearound so that water is introduced thereinto from the annular room;

(F) a first liquid transfer device for transferring the dispersion or solution of the polyacrylamide powder obtained from the powder dispersion device;

(G) a dissolution tank for receiving the dispersion or solution of polyacrylamide powder thus transferred by the first liquid transfer device and for completing dissolution of the polyacrylamide;

(H) a second liquid transfer device for transferring the polyacryalmide solution from the dissolution tank;

(I) a solution storage tank for storing the polyacrylamide solution thus transferred by the second liquid transfer device;

(J) a filtration device provided in the liquid supply line between the dissolution tank and the solution storage tank; and

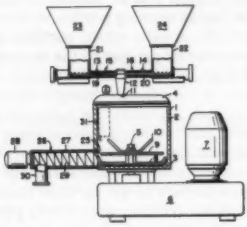
(K) a nitrogen gas supply system for maintaining the interiors of said units, wherein the polyacrylamide powder or the dispersion or solution thereof is present, filled with nitrogen gas at a pressure higher than atmospheric pressure.

4,518,262

MIXER FOR CONTINUOUSLY MIXING GRANULAR TO POWDERY MATERIALS

Hans-Joachim Bornemann, Vellmar, and Horst Zlab, Malsfeld, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 343,289, Jan. 27, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,876
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 8104051[U]
Int. Cl.³ B01F 15/02
U.S. Cl. 366—156 7 Claims



1. A high speed mixer for continuously mixing granular to powdery materials, said mixer comprising:

a stationary and essentially cylindrical container having a substantially vertical central axis, a side wall which extends substantially parallel to said central axis, a cover connected to the top of said side wall, and a bottom connected to the bottom of said side wall via a transition region; said cover is provided with a feeding opening which leads to the interior of said container; said side wall, in said transition region to said bottom, is provided with a discharge opening which is in communication with the interior of said container, with the bottom of said discharge opening lying in the same plane as the bottom of said container; the discharge of said discharge opening can be controlled;

blade-like mixing tools which are arranged coaxially in said container, with said mixing tools each having an axis of rotation which is at least parallel to said central axis of said container, and hence is likewise substantially vertical; said mixing tools are rotatable at high speed;

a supply housing arranged externally of said container and in communication with said feeding opening, said supply housing extending parallel to said central axis of said container, and having a funnel-shaped lower portion;

two worm conveyors arranged laterally of and in communication with the upper portion of said supply housing for supplying material thereto, said conveyors being operatively connected to first drive means for driving them individually or in common; and

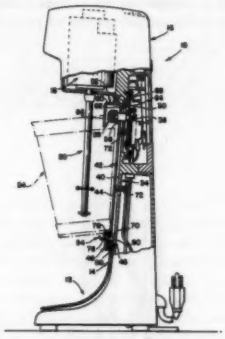
a further worm conveyor, the bottom of which lies in the same plane as the bottom of said container and the bottom of said discharge opening; said further worm conveyor is disposed externally of said container and is in communication with said discharge opening of said side wall thereof for receiving mixed material therefrom, and for effecting said control of said discharge thereof via the speed and direction of rotation of said further worm conveyor, with the latter being adapted to selectively open and close off said discharge opening; said further worm conveyor being operatively connected to second drive means for driving same; said first and second drive means being adapted to be driven at variable speeds and continuously during operation of said mixing tools in said container to effect said continuous mixing of materials.

4,518,263

SPLATTER SHIELD FOR USE WITH A DRINK MIXER

Stanley J. Brym, Torrington, and Bruno M. Valbona, Farmington, both of Conn., assignors to Dynamics Corporation of America, Greenwich, Conn.

Filed Jul. 2, 1984, Ser. No. 626,935
Int. Cl.³ B01F 7/26
U.S. Cl. 366—206 7 Claims



1. A splatter shield for use with an electric drink mixer of the type having an upright hollow standard in which is housed a switch assembly for operating a motor when a container contacts a switch actuator mechanism extending through a slot in a frontwall of the standard, the splatter shield comprising:

a one-piece body means for overlying the frontwall and supporting the container in position on the drink mixer, said body means including

(1) a body mounting means which is unitary with said body means for releasably mounting said body means on the standard, said body mounting means including a standard frontwall engaging means for extending through the slot in the in the front wall of the hollow standard and into engagement with an inner surface of the frontwall, adjacent to the slot in the frontwall, to hold the body means on the standard;

(2) a container support means which is integral with said body means for supporting a container in position to contact the switch actuator mechanism; and

(3) an elongate body means slot through which the actuator mechanism extends when said body means is mounted on the drink mixer, said body means slot being larger than the switch actuator mechanism so that said body means is spaced from said switch actuator mechanism in a manner eliminating the need for any part of said switch actuator mechanism to be removed in order to move said body means onto or away from the frontwall.

4,518,264

STIRRING APPARATUS

Hidenori Nohso, Kakogawa, Japan, assignor to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,947
Claims priority, application Japan, Jul. 13, 1982, 57-120596; Aug. 18, 1982, 57-142163
Int. Cl.³ B01F 9/00
U.S. Cl. 366—208 10 Claims

1. Apparatus for stirring material contained in a test tube having a longitudinal axis and upper and lower ends, comprising:

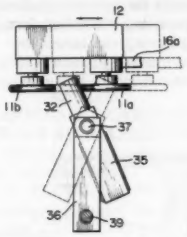
a holder for supporting said test tube;

means for swingably supporting said holder;

two spaced rollers rotating in opposite directions about respective roller axes; and

reciprocating means for causing relative movement between

said test tube and said rollers such that said rollers alternately engage said upper end of said test tube to alternately rotate said test tube in opposite directions about said longitudinal axis.

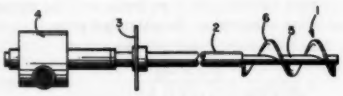


4,518,265

AGITATOR

Arne Andersson, Partille, and Peter Larsson, Stenkullen, both of Sweden, assignors to Trilack Utrustningar AB, Sweden

Filed Mar. 24, 1983, Ser. No. 478,517
Claims priority, application Sweden, Mar. 26, 1982, 8201925
Int. Cl.³ B01F *7/24*
U.S. Cl. 366—318 **3 Claims**



1. An agitator for stirring of liquids which are enclosed in vessels, said vessels having an outer dimension, an inner space, a wall having a thickness, and a hole in said wall, said inner space being accessible through said hole, said hole having a diameter which is substantially smaller than said outer dimension of a vessel, the agitator comprising a screw and a turnable shaft for the rotation of the screw, said screw having a center axis and a thread formed of a coiled body in the form of a stripe having portions located on opposite sides of said center axis, said stripe having a diameter which is larger than the diameter of said hole and a thickness which is smaller than the thickness of said wall and being coiled with a pitch which is so large compared to the thickness of the stripe and the thickness of the wall that, when the stripe is inserted into the hole with one of said portions thereof which is located on one of said sides of the center axis of the screw, the portions of said stripe on the other of said sides of the center axis and forming continuing extensions in both directions of the axis to the said one of said portions of the stripe will find room outside of the hole at both sides of the wall so that the screw together with said shaft can be screwed through the hole with the entire stripe forming the thread until the shaft is placed within the hole and the screw can be rotated within the vessel by turning the shaft.

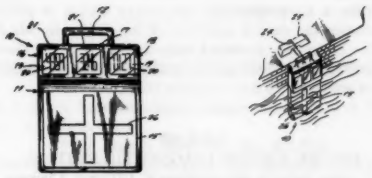
4,518,266

SWIMMER'S LAP PACER

Dale K. Dawley, 5845 Red Apple Ridge, Columbus, Ohio 43227

Filed Jul. 27, 1983, Ser. No. 517,681
Int. Cl.³ G04B *19/24*; G04F *8/00*
U.S. Cl. 368—10 **1 Claim**

1. A swimmer's lap pacer, comprising, in combination, a waterproof case containing a split timer, an elapsed timer and a lap counter in an electrical circuit, a "U"-shaped carrying handle upon an upper side of said case for being either held in a hand or receiving a tethering cord therearound, when said pacer is suspended over a swimming pool edge; said case including a front wall, an upper part of said front wall comprising an above-water portion having displays for said split timer, elapsed timer and lap counter, a depressible kickpad on a lower, underwater portion of said front wall, and a mechanism inside said case operated by said kickpad, for activating said electrical circuit.

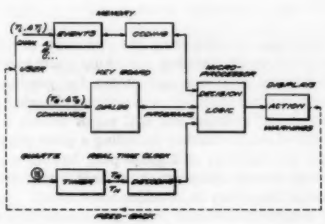


4,518,267

MOBILE EVENT-MODULE

Volker Hepp, Schröderstr. 90, D6900 Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 235,894, Feb. 19, 1981, abandoned. This application Jul. 1, 1983, Ser. No. 510,229
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009211
Int. Cl.³ G04F *8/00*; G04C *15/00*
U.S. Cl. 368—107 **18 Claims**



1. A mobile electronic device for a general correlation analysis of codified series of occurred, missed and expected events which are defined by their type, time of occurrence and/or duration, comprising:

clock means for providing clock pulses representing real time;

synchronization means for updating said clock means;

switchable means for providing timing signals representing timed occurrences, timed durations, expected occurrences and expected lapses;

codification means for marking said timing signals;

computing means including read-only memory means and register means for executing predetermined programs operating on said timing signals and being steered by a monitor program, said computing means providing resultant output signals;

instruction means for providing instruction signals to said computing means for executing specific tasks;

multiplexer and encoder means for identifying said instruction means;

random-access memory means for storing said timing signals and said instruction signals and resulting output signals of said computing means;

input-output interface means for providing input signals to and for receiving output signals from said computing means and said memory means and said clock means and said instruction means;

timer, counter and latching means in said interface means

responsive to signals from said instruction means and said computing means;

display means responsive to said interface means for displaying representations of output signals from said interface means;

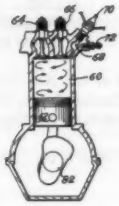
whereby a programmable interactive dialog is permitted between the device and user of the device in which the flow of events (codified time-marks) is controlled and modified, and which allows real-time and off-line correlation analysis.

4,518,268

DIESEL ENGINE DIAGNOSTIC SYSTEM

Philip E. Swis, Armada, and Anthony E. DiFonzo, Clawson, both of Mich., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Mar. 18, 1983, Ser. No. 476,618
Int. Cl.³ G01M *15/00*
U.S. Cl. 374—144 **20 Claims**



1. An apparatus for analyzing the operation of a diesel engine, said diesel engine defining a working cycle and having at least one internal chamber and means for passing a vapor through said internal chamber, said internal chamber including a prechamber and cylinder and said vapor having a temperature, said diesel engine further including a glow plug partially within said prechamber, said glow plug having a resistance dependent upon said temperature of said vapor within said prechamber, comprising, in combination:

passive temperature sensor means, interconnected to said diesel engine, for sensing said temperature of said vapor within said prechamber of said internal chamber and for providing a temperature signal representative of said temperature, said passive temperature sensor means including impedance sensor means for sensing said resistance of said glow plug, said temperature signal being dependent upon said resistance throughout said working cycle; and

display means, interconnected to said passive temperature sensor means, for monitoring said temperature signal throughout said working cycle and responsively providing a display based upon said temperature and representative of a brake mean effective temperature.

4,518,269

SERIAL PRINTER

Hiroyuki Akazawa, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Division of Ser. No. 305,413, Sep. 24, 1981, Pat. No. 4,452,542. This application Sep. 30, 1982, Ser. No. 430,418
Claims priority, application Japan, Sep. 25, 1980, 55-136236
Int. Cl.³ B41J *3/10*
U.S. Cl. 400—124 **1 Claim**

1. A serial printer comprising:

a head carriage adapted to move across a recording sheet for printing characters thereon; and

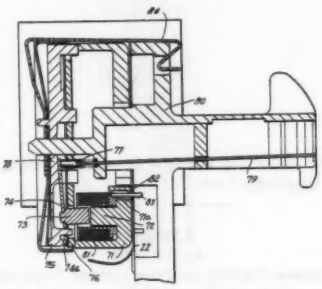
a print head for printing the characters, the print head being mounted on the head carriage, the print head further comprising:

a nose member;

a plurality of print wires slideably guided in the nose member;

a plurality of coils for selectively driving the print wires, each coil comprising a winding formed on a bobbin and each winding having end terminals;

at least two pins inserted in each bobbin, each end terminal of the associated winding being wound around a pin;



a core frame forming a portion of the magnetic circuit associated with each of said coils, there being holes formed in the core frame through which the pins extend; and

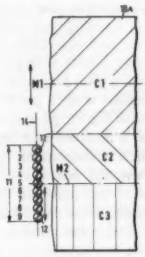
a flexible print cable for transmitting signals to the coils to actuate selected print wires for printing, the flexible cable being pressed between the core frame and the nose member and being soldered to the extended pins.

4,518,270

MULTICOLORED PRINTING

Wolfgang Hendrischk, Neu-Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,171
Int. Cl.³ B41J *35/16*
U.S. Cl. 400—240.4 **6 Claims**



1. Method of multicolor printing under utilization of a print head having at least one vertical column of print styli and cooperating with a print medium through impact printing comprising the steps of:

using a four color band ink ribbon and changing its print position so that in first and second ribbon positions the center of the column of styli is respectively centered on boundaries between the upper two bands and between the lower two bands;

printing in a plurality of passes of the print head along a print line wherein after each pass in which the print position of the ink ribbon is not changed the medium printed on is shifted in direction of the column while no such shift occurs after the shift of the ink ribbon in the direction of the column to place different bands in front of said styli,

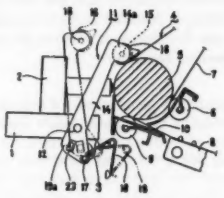
and providing an alternating sequence for the two ribbon positions in two sequential passes which is followed by paper shifting for the next pass, and repeating the sequence so that a steady state cycle includes two passes for printing with no medium shift and one pass preceded by medium shift.

4,518,271

PRINTER WITH MOVEABLE CARRIAGE ACTUATING PINCH ROLLER TO RELEASE POSITION

Yoshikatsu Hirata, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 27, 1984, Ser. No. 625,228
Claims priority, application Japan, Jul. 15, 1983, 58-129657
Int. Cl.³ B41J *13/02*
U.S. Cl. 400—636.1 **8 Claims**



1. A printer having a plurality of side frames, a platen having a printing surface rotatably supported by said side frames, and a carriage supporting a printing head and being movable along said printing surface of said platen, wherein said carriage is movable in a printing region and at the same time printing is performed by said printing head, said printing comprising

a paper holding device having a plurality of pressure rollers and being supported by said side frames so as to be rotatable between a closed position wherein said pressure rollers abut said platen and an open position wherein said abutting of said rollers against said platen is released;

an urging means for urging said paper holding device at least towards said closed position; and

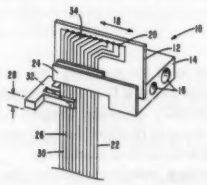
an actuating means being operated while said carriage is moved to one side out of said printing region and for moving said paper holding device from said closed position to said open position.

4,518,272

POSITION INDICATOR MEANS FOR A HIGH SPEED PRINTER OR THE LIKE

Rick A. George, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 12, 1984, Ser. No. 570,150
Int. Cl.³ B41J *29/42*
U.S. Cl. 400—705.1 **9 Claims**



1. A printer device which comprises:

an electrically operated print head which is movable relative to record media on which printing is to occur;

a scanner for sensing indicia of alignment of the print head relative to the record medium; and

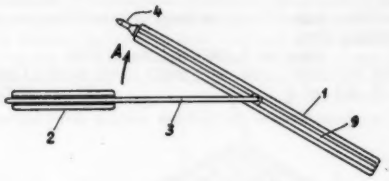
an electrical conductor connected to operate said print head, wherein said electrical conductor comprises an electrically conductive run which is supported by an electrically insulative material; and wherein said indicia are defined by optical contrast between said run and said insulative material.

4,518,273

INSTRUMENT FOR WRITING AND DRAWING WITH PIVOTABLE COVER

Pietro Larizza, Limbiate, Italy, assignor to Larizza & Scuratti s.d.f., Limbiate, Italy

Filed May 5, 1983, Ser. No. 491,824
Claims priority, application Italy, Sep. 30, 1982, 23063/82[U]
Int. Cl.³ B43K *9/00*
U.S. Cl. 401—98 **11 Claims**



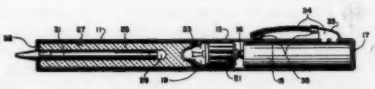
1. An instrument for writing or drawing comprising an elongated main body provided with a writing tip at one end thereof, longitudinal grooves extending for the entire length of the main body, a cover member carrying a pair of resilient members, said resilient members being pivotably connected at their ends to a fixed location on the main body, said resilient members being spaced apart so as to resiliently engage the grooves on the main body when the main body and the cover member are aligned.

4,518,274

PEN WITH BUILT-IN ILLUMINATION

Rolf Hanggi, 22442 Walnut Clr. S., Cupertino, Calif. 95014

Filed Aug. 22, 1983, Ser. No. 523,346
Int. Cl.³ B43K *29/10*
U.S. Cl. 401—195 **16 Claims**



1. A writing implement having a built-in illumination system comprising:

a tubular housing of an electrically nonconductive material having a first opening on one end and a second opening on its periphery, said tubular housing defining a compartment for receiving a battery located within said tubular housing opposite said end having said first opening;

lamp means disposed to be located within said tubular housing for providing illumination in the direction of said first opening, said lamp means having first and second electrical contacts with said first electrical contact having an electrical path to said second opening and said second electrical contact being disposed to interconnect with the positive terminal of a battery within the tubular housing;

marking means disposed to be located at least partially within said tubular housing and to extend through said first opening for providing a mark on a surface when touched to said surface;

spring-clip means constructed of an electrically conductive material including a fixed portion and a slidable portion,

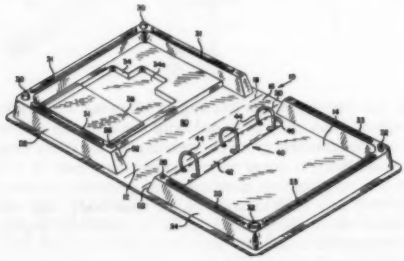
said fixed portion being fixedly attached to said tubular housing and extending into the interior of said tubular housing wherein it is disposed to make direct electrical contact with an electrically conductive portion of the case of a battery therein, said slidable portion being slidably affixed to the fixed portion on the exterior of said tubular housing and having a maximum possible displacement extending at least to said second opening in said tubular housing for providing an electrical path which is substantially exterior to said tubular housing between said second opening and said electrically conductive portion of said battery case via said spring-clip means when said slidable portion is displaced to said second opening.

4,518,275

PACKAGE AND STORAGE CONTAINER FOR DISKETTES

Cloyd D. Rauch, III, Beaverton, and Ronald W. Schneberger, Troutdale, both of Oreg., assignors to Rundel Products, Inc., Portland, Oreg.

Filed Jul. 7, 1983, Ser. No. 511,765
Int. Cl.³ B42F *13/00, 5/00;* **B65D** *19/04;* **B42D** *15/00*
U.S. Cl. 402—80 P **9 Claims**



1. A container for computer software diskettes comprising: a top cover, a bottom cover and back hingedly connected along one edge to a corresponding edge of the top cover and along the opposite edge to a corresponding edge of the bottom cover, a wall section provided on the inside of each of said top and bottom covers along the unconnected edges thereof, said wall sections extending inwardly and defining an enclosed cavity with the covers folded together, fastening means for releasably fastening the covers together in the closed position, a pocket provided on the inside of the top cover, said pocket being formed by a depression in the wall thickness of the top cover and being shaped to accommodate the diskette, and a strap spanning the depression for holding a diskette within the depression, and a binder ring unit attached along the connected edge inside the bottom cover, said binder ring unit adapted to receive instructional materials for securely storing such materials with the container closed and for easy access and reference without removal with the container open and laid flat.

4,518,276

METHOD AND APPARATUS FOR REPEATABLY ALIGNING ADJACENT MEMBER

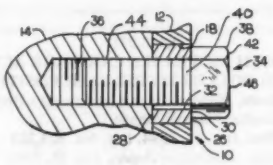
Thomas L. Mitchell, Washington; Patrick D. McMahill, Chillicothe; Gary G. Valbert, Peoria, and John C. Wellauer, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 27, 1984, Ser. No. 583,906
Int. Cl.³ F16B *17/00*
U.S. Cl. 403—13 **7 Claims**

1. A bolt-on dowel adapted to repeatably position a first member relative to a second member, said first member being releasably connected to said second member and having a through bore therein, comprising:

a cylindrical spacer having a first end, a second end and a through bore, said spacer being adapted to closely slidably fit within said bore of the first member and the first end being in abutment with the second member; and

means for securing the spacer to the second member at one of a multiplicity of positions at the initial assembly of the



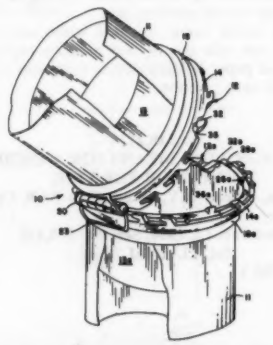
first member to the second member so that the cylindrical spacer remains in abutment with the second member when the first member is released from the second member and repositions the first member relative to the second member at subsequent assembly.

4,518,277

SELF-LOCKING MECHANICAL CENTER JOINT

Harold G. Bush, Yorktown, and Richard E. Wallsom, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,646
Int. Cl.³ F16C *11/00*
U.S. Cl. 403—102 **11 Claims**



1. A self-locking joint for securing two structural members in linear relationship along a first axis comprising:

a pair of substantially identical hinged hub members disposed in side-by-side relationship and adapted for connection to separate structural members;

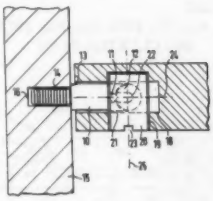
means for effecting relative rotative movement of said hinged hub members about a second axis transverse to said first axis to position said hub members in face-to-face abutting relationship; and

substantially identical rotatable means disposed on each said hub member and having portions thereof adapted to mesh for locking said hinged hub members in the face-to-face abutting relationship.

4,518,278
CONNECTING DEVICE FOR DETACHABLY MAINTAINING FLAT STRUCTURES PERPENDICULAR TO EACH OTHER

Gerhard Koch, Nagold, Fed. Rep. of Germany, assignor to Hafele KG, Fed. Rep. of Germany

Filed Jan. 10, 1983, Ser. No. 456,608
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204737
Int. Cl.³ B25G 3/00; F16B 7/08
U.S. Cl. 403—230 10 Claims



1. Connecting device for detachably maintaining flat panels perpendicular to each other comprising: a fastener bolt having a head (12) set apart from a shank portion by a reduced cylindrical section (11), said head and said shank portions having the same diameter and said cylindrical section having a substantially smaller diameter than said head and said shank portions, said head (12) of said fastener bolt (10) adjacent said cylindrical section being in the form of a hemispherically shaped cup, the curved side of which forms one side and the stepped transition from said shank portion to said reduced cylindrical section forms the opposite side of an attachment groove; and a cylindrical tightening bolt (20) having cylindrical tightening bore (21) sized for receipt of said fastener bolt head and perpendicular to and extending up to the axis of rotation (25) of said tightening bolt (20) and then merging into a hemispherical cup (28) sized to mate with said hemispherically shaped cup and having tightening slot (22) extending the length of the side wall of said tightening bore (21) up to said hemispherical cup (28) forming a part of said tightening bore (21); said fastener bolt fastening to the first said panel with said shank, said attachment groove and said head protruding therefrom, said tightening bolt rotatably received in a first blind bore provided in the second said panel, said fastener bolt inserted into a second blind bore provided in the second said panel, whereby the axis of rotation of said tightening bolt and the longitudinal axis of said first blind bore receiving said tightening bolt are perpendicular to the longitudinal axes of said fastener bolt and said second blind bore, and are lying in a plane extending through the longitudinal axes of both said fastener bolt and said first blind bore, said tightening bolt operatively engaging said head of said fastener bolt in such a manner that said tightening slot of said tightening bore is engaged in said attachment groove, and as said tightening bolt is rotated, said fastener bolt is pulled along its longitudinal axis into said second blind bore causing the two panels to be firmly joined, said tightening bolt being capable of being rotated up to about 180° from its initial input position.

4,518,279
BASE ELEMENT CONNECTION FOR SHEET METAL FURNITURE

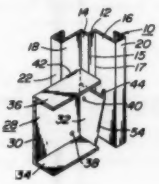
James M. Suttles, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.

Filed Sep. 27, 1983, Ser. No. 536,265
Int. Cl.³ E04H 12/06; A47F 5/10
U.S. Cl. 403—231 4 Claims

1. In an article of sheet metal furniture, such as a merchandising display stand, comprising a sheet metal upright post, and first and second sheet metal panels meeting the post at right angles to each other, an improved structure wherein:

the upright post comprises a sheet of metal formed into a horizontal cross-sectional configuration having first and second vertically elongated planar sections meeting each other at right angles along a first vertical corner line, and a third vertically elongated planar section meeting the first section along a second vertical corner line spaced from the first vertical line, the second and third sections being on opposite sides of the plane of the first section;

the first panel is rigidly attached to the upright post and comprises a first panel section meeting the second section of the post perpendicularly at a location spaced from the first corner line, and a second panel section unitary with the first panel section and extending perpendicularly from the end of the first panel section, along the second section of the post, and past the first vertical corner line so that a portion of the third section of the post and a portion of the second panel section are positioned opposite and parallel to each other, the second panel section having an edge remote from the intersection of the first and second panel sections, said edge being oblique in a vertical plane with the distance between its lower end and said intersection being less than the distance between its upper end and said intersection, said second panel section having a flange along said oblique edge, said flange being unitary with the second panel section, meeting the second panel section



along an oblique line of intersection, and extending toward the space between the second panel section and the third section of the post; and

the second panel comprises a third panel section extending parallel to the third section of the post and into the space between the third section of the post and said second panel section, said third panel section lying against the third section of the post and having an edge meeting said first panel section, a fourth panel section, unitary with the third panel section, and extending perpendicularly from said edge of the third panel section, lying against said first section of the post and extending to and meeting the second panel section, and a fifth panel section, unitary with the fourth panel section, extending perpendicularly from the fourth panel section and lying against the second panel section, the fifth panel section having an oblique edge in a vertical plane, said oblique edge conforming to the line of intersection between the second panel section and its flange;

whereby a downward force on the second panel causes the oblique edge of the fifth panel section, in cooperation with the line of intersection between the second panel section and its flange, to effect tightening of the fourth panel section against the first section of the post.

4,518,280
AQUATIC WEED BARRIER

Eldon L. Fletcher, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Division of Ser. No. 402,859, Jul. 29, 1982, Pat. No. 4,481,242.
This application Apr. 25, 1984, Ser. No. 603,907
Claims priority, application Canada, Mar. 16, 1982, 398464
Int. Cl.³ E02B 3/00
U.S. Cl. 405—17 10 Claims

1. A method for substantially preventing growth of aquatic weeds comprising laying a film of synthetic thermoplastic

polymer onto the bed of a water body, said film having a plurality of incisions therein, each incision being shaped to

form at least one flap of film adjacent the incision, such film also having a light transmittance in the 200 to 650 nm wavelength range of less than 50%.

4,518,281

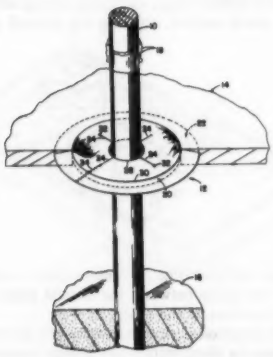
ICE SUPPRESSION MAT

Thomas J. Coe, 86 Nicholas Ave., Groton, Conn. 06340

Filed Dec. 30, 1983, Ser. No. 567,408

Int. Cl.³ E02B *15/02*; E02D *5/60*; B32B *3/02*

U.S. Cl. 405—61 **19 Claims**



15. An ice suppression mat for preventing an ice sheet from forming around and adhereing to a marine pile partially submerged in a body of water subject to natural icing conditions, said mat comprising:

a first laminate having one or more layers of a bouyant, thermal insulating material forming a first sheet having a first predetermined surface area;

a second laminate having one or more layers of a flexible, tear resistant reinforcing material forming a second sheet having a second predetermined surface area, said second sheet being intimately joined to said first sheet to form a laminated and reinforced mat;

said laminated mat defining a centrally located opening through the first and second laminates for accommodating a marine pile to be protected and permitting said mat to move axially along said protected pile as the water level rises and falls;

said second predetermined surface area being larger than said first surface area to provide a fringe of reinforcing material along the outer perimeter of said laminated mat whereby said fringe may become embedded in an ice sheet which forms around said mat such that said mat becomes an integral part of the ice sheet and moves axially along said protected marine pile as said ice sheet rises and falls, said second surface area being substantially less than the body of water surface area, and

said laminated mat has means defining a slit extending radially outward for a predetermined distance from said opening in said mat, said mat having a plurality of said radial slits to permit deformation of the edge of said opening as said mat moves over irregularities or ice formations on the surface of said pile.

4,518,282

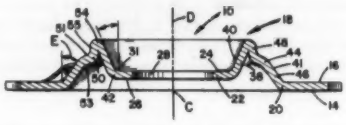
MINE ROOF BEARING PLATE WITH EMBOSSED AREA HAVING CONICAL AND CYLINDRICAL SECTIONS

Raymond J. Wilcox, Rancho Bernardo, and Earl W. Powers, Chula Vista, both of Calif., assignors to Republic Corporation, Century City, Calif.

Filed Aug. 27, 1981, Ser. No. 297,011

Int. Cl.³ E21D *21/00*

U.S. Cl. 405—259 **11 Claims**



1. A bearing plate for supporting a portion of a mine roof or similar surface, said bearing plate comprising:

roof-bearing means including a roof-bearing surface for supporting said portion of said mine roof;

bolt-head bearing means including an aperture adapted to receive a roof bolt having a bolt head;

a reinforcing wall divided into a frusto-conical portion, the base of which is connected to said roof-bearing means, and a cylindrical portion, the base of which is connected to the distal end of said frusto-conical portion, the diameter of the base of said cylindrical portion being less than the diameter of the distal end of said frusto-conical portion, said cylindrical portion being substantially perpendicular to said bolt-head bearing means; and

wall means connecting the distal end of said cylindrical portion with said bolt-head bearing means for translating a bearing force applied to said bolt-head bearing means by said bolt-head to said bearing surface for supporting said portion of said mine roof.

4,518,283

HARDENABLE SYNTHETIC RESIN COMPOSITION AND ITS USE

Ludwig Gebauer, Stuttgart; Hans-Jürgen Irmscher, Emmering; Gusztav Lang, Munich, and Peter Mauthe, Kleinberghofen, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Luxembourg

Filed Jul. 13, 1983, Ser. No. 513,152

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226602

Int. Cl.³ B65D *25/08*; C08L *67/06*

U.S. Cl. 405—260 **15 Claims**

1. A method for securing tie bars in bore holes wherein mortar composition is contacted with the tie bar and allowed to harden, the improvement which comprises said composition comprising a total of

15 to 35 weight percent of unsaturated polyester,

9 to 25 weight percent of reactive diluent,

44 to 66 weight percent of filler,

0.5 to 4 weight percent of thixotropic agent, and 1 to 6 weight percent of a hardener composed of a free radical curing catalyst,

the percentages being based in each case on the total composition.

4,518,284
MINE ROOF SUPPORTS

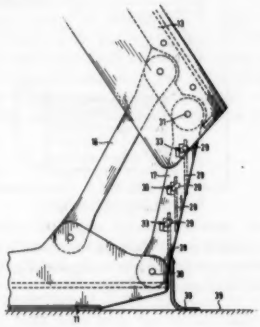
Kunibert Becker, Werl; Rüdiger Kirchbrücher, Dortmund-Brackel, and Klaus D. Pohlmann, Werne, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,614

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211595

Int. Cl.³ E21D *23/04*

U.S. Cl. 405—296 **12 Claims**



1. A mine roof support comprising a floor-engaging structure, a roof-engaging structure, hydraulic props mounted between the floor and roof-engaging structures and a goaf shield connected to the floor-engaging structure with lemniscate guides spaced apart laterally of the support; wherein the floor engaging structure takes the form of spaced-apart skids with a walking mechanism therebetween, the skids being relatively displaceable, at least to a limited extent, in both a direction transverse thereto and vertically, and, the guides are provided with connection means for releasably attaching at least one screen plate to screen off the lower region of the goaf zone from the interior of the support, said at least one screen plate also forming a distance piece defining the minimum spacing between the skids.

4,518,285
CONTROL SYSTEM FOR LONGWALL MINING ROOF SUPPORTS

Karl-Heinz Weber, Witten-Heven; Wolfgang Beckmann, Marl, and Hartmut Gebaüer, Bottrop, all of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH, Bochum, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,050

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207517

Int. Cl.³ E21D *23/12, 23/16;* F16B *13/00*

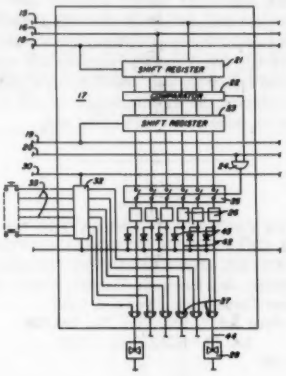
U.S. Cl. 405—302 **4 Claims**

1. In a control system for longwall mining roof supports wherein the supports are controlled by a computer in dependence on the position of a longwall mining machine at any time, the computer being connected to individual control units for the roof supports through common electrical conductors, and wherein each control unit is provided with manual control pushbuttons and associated control circuitry for controlling the roof support independently of command signals received from said computer, the improvement in said control system comprising:

a pair of electrical conductors connecting said computer to all of said control units,

means in said computer for generating on one of said conductors an automatic enable signal and for generating on the other of said conductors a manual enable signal, and

means in each of said control units responsive to said enable signals for preventing manual actuation of a roof support when automatic command signals are being transmitted



from said computer and for preventing automatic actuation of a roof support when manual control is being effected

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4,518,286
SYSTEM FOR PUMPING SUSPENDED PARTICLES UPWARD

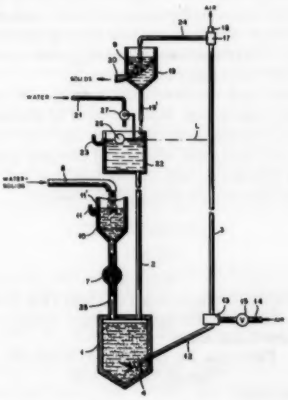
Knut Vaupel, and Peter Schulz, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,899

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203578

Int. Cl.³ B65G *53/30*

U.S. Cl. 406—46 **4 Claims**



1. A system for fluidically elevating solid particles from a lower level to an upper level, comprising:

a vessel closed against the atmosphere;

a first tube extending upward from the top of said vessel and containing a liquid which forms therein a hydrostatic column of given height;

a second tube with an inlet end at said vessel and with an outlet end at a level substantially above that of said vessel;

a conduit at a level substantially below that of said outlet end loadable with solid particles to be entrained by said liquid

through said second tube, said conduit being provided with gating means preventing a backflow of said liquid and maintaining the hydrostatic pressure of said column in said vessel; and

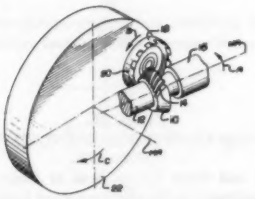
a source of gas communicating with said second tube near said inlet end for injecting bubbles into a slurry which is formed by said liquid and said particles and which enters said second tube from said vessel through said inlet end, thereby reducing the specific weight of said slurry sufficiently to let same rise to said outlet end.

4,518,287

METHOD OF FACE MILL GENERATION OF SPIRAL BEVEL GEARS WITH INTEGRAL CENTRAL STRUCTURE AND RESULTING PRODUCT

Robert B. Bossler, Jr., Hacienda Heights, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Filed Jul. 7, 1982, Ser. No. 396,026
Int. Cl.³ B23F *9/12, 17/00*
U.S. Cl. 409—26 **7 Claims**



1. A method of face mill generation of a spiral bevel gear with an integral central structure that protrudes from the toothed face of the gear comprising:

forming a gear blank integrally with said central structure;

cutting one or more individual gear tooth surfaces of a single tooth valley on said blank by causing a cutting tool to rotate and thereby repeatedly engage said blank and remove material therefrom while causing said cutting tool to orbit about a machine axis and while rotating said blank so as to simulate a gear mesh with said cutting tool;

indexing said blank relative to said cutting tool; and

cutting one or more gear tooth surfaces of another tooth valley, said tool being positioned such that the cutter distance exceeds the outer cone distance of the gear thus generated whereby the path of said cutting tool does not intrude into the space occupied by said central structure.

4,518,288

MACHINABLE WAX FOR PROTOTYPE PATTERNS

Leticia D. Cilindro, Strongsville, Ohio, assignor to Loreto Turco, Avon Lake, Ohio

Filed Jun. 24, 1982, Ser. No. 391,554
Int. Cl.³ B23Q *3/02*
U.S. Cl. 409—219 **13 Claims**

9. An assembly for machinin prototype patterns with tolerances in the range of 0.001 inches or better, the assembly comprising:

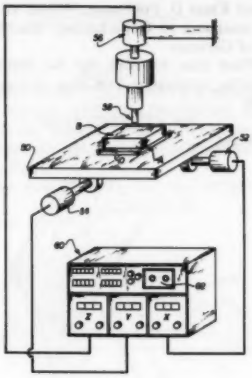
(a) holding means for stably holding a wax block during a machining operation;

(b) anchoring means for anchoring the wax block to the holding means; and,

(c) the wax block comprising a mixture of:

(i) 50–85 percent nonemulsifiable polyethylene wax having a density of 0.90–0.94 grams per cubic centimeter at 77° F.;

(ii) at least 5 percent hydrocarbon wax which lowers the melting point of the mixture and acts as a lubricant; and,



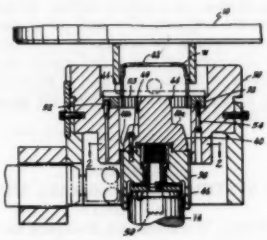
(iii) at least 5 percent synthetic resin which includes a vinyl acetate polymeric component to improve hydrocarbon wax compatibility.

4,518,289

POT BROACH

Leonard A. Gabriele, Warren, Mich., assignor to Lear Siegler, Inc., Del.

Continuation-in-part of Ser. No. 264,859, May 18, 1981, abandoned. This application Jan. 3, 1984, Ser. No. 568,212
Int. Cl.³ B23F *1/08*
U.S. Cl. 409—244 **3 Claims**



1. A pot broaching machine for cutting peripheral tooth-forming slots in the outer surface of the side wall of a cup-shaped thin-walled workpiece having a peripheral shell having a thin side wall provided with an inner and an outer cylindrical surfaces, which comprises

a stationary frame,

a vertically elongated pot broach on said frame having a multiplicity of circumferentially spaced parallel rows of longitudinally stepped cutting teeth adapted to cut slots in the outer cylindrical surface of the side wall of the workpiece, the root surfaces between at least some of the circumferentially adjacent rows of cutting teeth being guide surfaces parallel to the axis of said broach,

an internally toothed guide ring on said frame spaced axially below said broach and having guide teeth in axial alignment with the cutting teeth in said broach,

a work support of generally circular cross-section comprising a support portion having an external cylindrical surface engageable with the inner surface of the thin cylindrical side wall of the workpiece shell to center and support the workpiece on said work support,

said work support also comprising a guide portion of generally circular cross-section having at its periphery a multiplicity of radially outwardly extending guide and support teeth in alignment with the spaces between adjacent rows of broach teeth and with the spaces between adjacent guide teeth in said guide ring, each guide and support tooth having a circumferential width slightly less than the circumferential spacing between adjacent rows of broach teeth and having a guide surface at its crest located at a radial distance from the axis of said work support to engage a corresponding one of the elongated guide surfaces of said broach,

and means for moving the work support vertically to cause the upper ends of its guide and support teeth to pass through the tooth spaces of said locating ring into engagement with the end surface of the cylindrical shell of a workpiece located initially on the guide teeth of said locating ring and to push the workpiece through said broach.

4,518,290

ANCHORING BOLT

Albert Frichmann, Teningen; Danilo Sternisa, Emmendingen; Kurt Mermi, Teningen, and Herbert Kistner, Freiburg-Betzenhausen, all of Fed. Rep. of Germany, assignors to Upat GmbH & Co., Emmendingen, Fed. Rep. of Germany

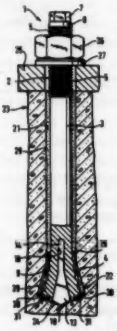
PCT No. PCT/DE82/00127, § 371 Date Feb. 22, 1983, § 102(e) Date Feb. 22, 1983, PCT Pub. No. WO82/04461, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 12, 1982, Ser. No. 474,594

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124244; Oct. 2, 1981, 3139174

Int. Cl.³ F16B *13/08*

U.S. Cl. 411—30 **16 Claims**



1. Anchoring bolt having a smooth shaft portion (3) interposed between and integral with a connection portion (2) and an insertion portion (4) for insertion, by drilling, into a cylindrical bore (21) and for conically undercutting the walls of said bore after insertion, said insertion portion extending to an end of the bolt and having, in accordance with the invention:

at least two diametrically opposite inserts (30) set in radially running bores (13,32) of said insertion portion of said bolt near said end of said bolt and of said insertion portion, said inserts protruding beyond the periphery of said insertion portion of said bolt;

a diametrical slot (10) extending axially into said insertion portion of said bolt from said end thereof at the end of said bolt, and

an axially displaceable elongated spreading wedge (13) having a tapered-down end inserted in said slot of said insertion portion of said bolt and having a width that does not exceed the outer diameter of said insertion portion of said bolt.

4,518,291

PLASTICS MATERIAL EXPANSION DOWEL WITH WAVE-FORM SLOTS

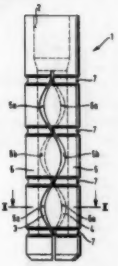
Gusztav Lang, Munich; Armin Hoffmann, Germering, and Heinz Bisping, Munich, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Feb. 22, 1984, Ser. No. 582,460

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308755

Int. Cl.³ F16B *7/00*

U.S. Cl. 411—60 **12 Claims**



1. Plastics material expansion dowel comprising an axially extending dowel body with a generally cylindrically shaped outside surface, said body being arranged to be inserted into a receiving hole and having a leading end and a trailing end with the leading end inserted first into the receiving hole, said dowel body having a central hole extending in the axial direction thereof from the trailing end and arranged to receive a spreading screw inserted into the trailing end to be threaded into the central hole for expanding said dowel body into engagement with the surface of the receiving hole, said dowel body having a wave-form slot therein extending in the axial direction thereof on each of two opposite sides of the central hole with said slots extending for at least a part of the axial length of said dowel body, wherein the improvement comprises that said dowel body over the axial length of said slots is divided into said dowel body halves by said slots and said central hole, and said wave-form slots in the screw-in direction of the spreading screw have alternating wave crests and wave troughs with the number of wave crests exceeding the wave troughs by one, said slots having transition regions located between adjacent wave crests and wave troughs, the outside surface of said dowel body only in the transition region of the slots from the wave crests to the wave troughs is profiled by recesses extending in the circumferential direction of said dowel body in a plane disposed perpendicularly to the axis of the dowel body.

4,518,292

METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Division of Ser. No. 209,134, Nov. 21, 1980, Pat. No. 4,419,805. This application Jul. 5, 1983, Ser. No. 497,113

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ E21D *20/02;* **F16B** *13/00;* **B23P** *25/00*

U.S. Cl. 411—82 **8 Claims**

1. A bolt assembly for securing a bolt in a bore hole having a bonding material therein comprising,

bonding material adapted to be positioned in an unmixed condition in a bore hole,

a bolt having a threaded end portion,

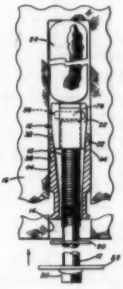
a camming plug having an internally threaded bore and an outer surface, said camming plug threadedly engaged to the threads adjacent the end of said bolt threaded end

portion, said camming plug positioned to move axially on said bolt upon rotation of said bolt in a preselected direction,

an expandable shell having a plurality of longitudinally extending fingers,

said fingers each having an inner surface and an outer surface, a portion of said inner surface abutting a portion of said camming plug outer surface and a portion of said finger outer surface adapted to engage the wall of said bore hole,

said expandable shell fingers arranged to expand outwardly to engage said outer surface of said fingers to the wall of



said bore hole by longitudinal movement of said camming plug relative to said bolt threaded end portion and said expandable shell,

means for mixing at least a portion of said bonding material in said bore hole upon rotation of said bolt in said preselected direction in said bore hole while maintaining said expansion fingers in an unexpanded condition, and

means for moving said camming plug axially on said bolt threaded end portion and relative to said expandable shell fingers upon rotation of said bolt in said same preselected direction to expand said fingers and anchor said bolt in said bore hole.

4,518,293

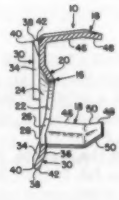
TUBE CONNECTOR

George C. Pleickhardt, Des Plaines, and E. Grant Swick, Bartlett, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 27, 1982, Ser. No. 412,345

Int. Cl.³ F16B *37/02, 37/04*

U.S. Cl. 411—107 **9 Claims**



1. A tube connector constructed from an integral sheet metal stamping comprising a body and a plurality of legs, said body having a centrally disposed securing portion for receipt of a threaded fastener and being of a substantially dished shape, said dish-shaped body having a plurality of spaced arcuate segments, each of said arcuate segments having a sharp peripheral edge for aggressively engaging the interior wall of a tube, said plurality of legs being formed in alternate arrangement with said arcuate segments and spaced therefrom by a marginal recess, each of said plurality of legs extending from said body adjacent said arcuate segments and bent at a substantially right angle in a direction opposite to the direction of said arcuate segments, the elongated portion of each of said legs being substantially longer than the width of said dish-shaped body and having sharp longitudinal edges for aggressively engaging the interior wall of a tube.

4,518,294

ROTARY FASTENER

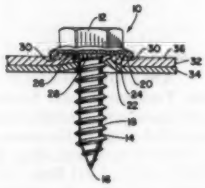
Gerald D. Barth, So. Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1982, Ser. No. 359,450

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.³ F16B *39/28*

U.S. Cl. 411—188 **7 Claims**



1. A rotary fastener for use in attaching a first panel to a second panel, said fastener comprising a head having an underside and a shank, said shank having at least one helical thread thereon and at least one helical ramp extending along said shank from said underside, said ramp having a generally axially oriented surface which varies in axial length from one end of said ramp to another, said ramp having a generally radially oriented surface of generally increasing radial dimension from one end of said ramp to another and said ramp radially extending surface having a minimum radial extent at a point where said ramp axially oriented surface is at a maximum length, said underside having a generally annular recess defined by inner and outer boundaries, said inner boundary defined by said ramp, said outer boundary defined by a sloping surface which intersects a rim at peripheral portions of said underside, said underside including a plurality of nibs, said nibs traversing said outer boundary.

4,518,295

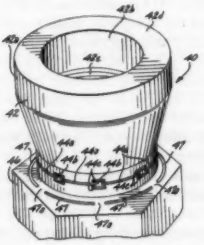
MULTI-PART FASTENING NUT, INCLUDING JAM NUT

Josip Matuschek, Newport Beach, Calif., assignor to Textron Inc., Santa Ana, Calif.

Filed Jun. 20, 1983, Ser. No. 506,050

Int. Cl.³ F16B *39/28*

U.S. Cl. 411—291 **12 Claims**



1. A nut for use with a bolt in making connection with one or more workpieces, comprising in combination,

a generally cylindrical sleeve formed with internal fastening threads,

a grip member formed with means to be gripped by a tool,

means formed with internal fastening threads and interconnecting said sleeve and said grip means whereby torque is transmitted from said tool to said sleeve through said grip member,

and control means comprising laser cuts in said interconnecting means along a plane perpendicular to the axis of said sleeve and including relief on opposite sides of said plane in close proximity to each of the shear sections between said laser cuts to enable the shear section adjacent each shear surface following shearing to be recessed into said sleeve and inner connecting means respectively, whereby oppositely disposed side surfaces of said laser cut surfaces are urged into abutting engagement by said torque.

4,518,296

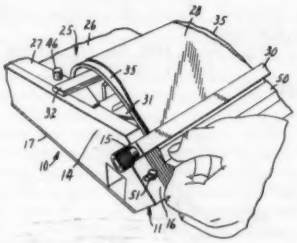
APPARATUS FOR BINDING SHEETS TOGETHER

Walter C. Pearson, St. Paul, and Dorman N. Thompson, Jr., St. Croix Beach, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1983, Ser. No. 533,507

Int. Cl.³ B42C *9/00*

U.S. Cl. 412—37 **7 Claims**



1. A binding machine for binding a stack of sheets together comprising

means defining a slot for receiving a plurality of sheets so they may be aligned edgewise,

clamping means for clamping said sheets adjacent one edge in position in said slot,

means for bringing and holding said aligned edges of said sheets over the opposite edges to a position for binding against a binding platen and for offsetting said sheets edgewise, and

tape support means for positioning a length of pressure-sensitive tape along said platen and the offset edges of said sheets thereon for binding said sheets together.

4,518,297

MOLDED PLASTIC SOCKET WITH EASY-ON HARD-OFF STUD ENGAGER

Willibald Kraus, Kaiserslautern, Fed. Rep. of Germany, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 28, 1982, Ser. No. 437,226

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143775

Int. Cl.³ F16B *29/00;* **F16L** *3/08*

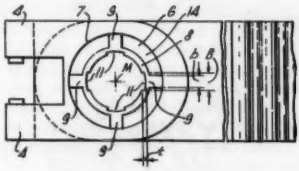
U.S. Cl. 411—437 **11 Claims**

1. A plastic fastening device for attachment on a threaded bolt comprising:

a mounting section, a wall on the mounting section, and a cylindrical aperture defined by said wall;

a thin-walled cylindrical sleeve having an inner surface and an outer surface, said sleeve axially disposed within and radially spaced from said aperture;

a plurality of radially extending ribs connecting said sleeve to said wall,



a plurality of grooves formed in said inner surface and extending in the direction of the longitudinal axis of said sleeve said grooves generally overlying said ribs and extending parallel thereto.

4,518,298

HEAD FOR INDUSTRIAL ROBOT

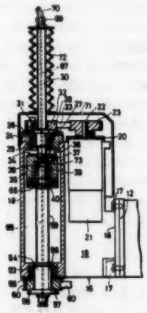
Kazuyoshi Yasukawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Mar. 22, 1983, Ser. No. 477,803

Claims priority, application Japan, Mar. 25, 1982, 57-42159[U]

Int. Cl.³ B25J *15/00*

U.S. Cl. 414—4 **16 Claims**



1. A head for an industrial robot comprising,

a head body (**15**) mounted on an end of an arm of said industrial robot,

a motor (**21**) for generating a rotational torque,

a nut member (**28**) rotatably supported in said head body,

a guide member (**54**) rotatably supported by said head body,

rotational coupling means for drivingly coupling said motor and said nut member to each other,

a screw rod (**30**) passing through and threadedly engaging with said nut member,

a shaft (**59**) having a non-circular shape in cross section, said shaft passing through and engaging with said guide member to rotate with said guide member but not move with said guide member longitudinally on an axis of said shaft,

means for rotatably sealably coupling a lower end of said screw rod and an upper end of said shaft to each other,

means for preventing rotation of said screw rod,

means for rotating said guide member (**54**), and

passages (**67, 68**) formed in said screw rod and said shaft.

4,518,299

ROUND BALE CARRIER AND UNROLLER

Clarence B. Vanderlei, R.R. 1, Springfield, S. Dak. 57062

Filed Feb. 24, 1983, Ser. No. 469,398
Int. Cl.[3] A01D *87/12*
U.S. Cl. 414—24.6 11 Claims

1. A load carrier including a wheeled trailer main frame defining front and rear end portions and provided with hitch structure at said front end portion, the rear end portion of said main frame including opposite side support wheels, an upstanding lift frame pivotally supported at its lower end from the rear end portion of said main frame for swinging about a horizontal transverse axis between a first rearwardly and upwardly inclined position and a second position with said upper portion swung forwardly, force means operatively connected between said lift and main frames for selectively swinging said lift frame from said first position to said second position, said load gripping means including a pair of opposite side arms pivotally supported from upper opposite side portions of said lift frame and projecting rearwardly therefrom, actuator means carried by said lift frame and operatively connected to said arms for swinging the free ends of said arms toward and away from each other for gripping and releasing a load therebetween an upstanding tine frame including a plurality of elongated upstanding arms each including a rearwardly projecting tine supported from its lower end, the upper ends of said arms being pivotally supported from the upper portion of said lift frame for limited angular displacement about a horizontal transverse axis with the lower ends of said arms being swingable toward and away from the axis of rotation of said lift frame relative to said main frame, and means operative to selectively angularly displace said tine frame relative to said lift frame.

4,518,300

TAKE-AWAY TECHNIQUE FOR SLICED BULK PRODUCTS

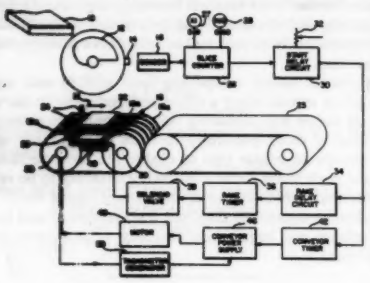
David P. Kent, West Chester, Pa., assignor to Control Process, Inc., West Chester, Pa.

Filed Nov. 12, 1982, Ser. No. 441,379
Int. Cl.[3] B65G *47/88*
U.S. Cl. 414—46 14 Claims

10. A take-away system for stacks of sliced bulk product comprising:

conveyor means forming a support for receiving slices of said bulk product to form a stack of said slices beneath a slicing means, means for intermittently moving said conveyor means in a predetermined direction to displace a stack in said direction;

pushing means having finger means for engaging the trailing edge of the stack and pushing it toward a discharge end of said conveyor, means associated with said pushing means for causing reciprocating movement of said finger means in relationship to the intermittent movement of said conveyor, and means for controlling the movement of said conveyor means so as to be faster than the movement of said finger means, whereby said finger means overtakes the stack which is being displaced on said conveyor and engages the trailing edge of said stack only as a result of slippage of the stack on the conveyor surface; and



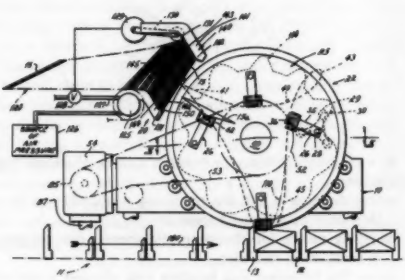
means for actuating movement of said conveyor means and said pushing means after a predetermined slice count has been obtained.

4,518,301

ORBITAL FEEDER

Joseph D. Greenwell, Florence, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jul. 6, 1982, Ser. No. 395,288
Int. Cl.[3] B65G *59/10*
U.S. Cl. 414—129 7 Claims



1. A magazine for carton feeding apparatus comprising,

a substantially horizontal conveyor for conveying cartons resting on their lower edges, said cartons leaning forward toward the discharge end of the magazine, a choke at the discharge end of the conveyor, said choke comprising,

a downwardly-inclined lower guide (**142**),

an upper guide (**141**) above said lower guide and positioned forward of said lower guide,

said lower and upper guides having parallel surfaces (**144**), (**143**) spaced apart a distance less than the dimension of the cartons (**15**) between their folded edges, so as to cause the cartons to lie between the guides at an angle to a line perpendicular to the surfaces (**143**), (**144**), with the upper edges of said cartons leading against said upper surface (**143**),

whereby as the leading cartons are advanced between said guides, said cartons, leading forward and urged by gravity to fall through said guides, have their upper edges restrained by said upper guide, thereby removing substantially all of the pressure of the upstream cartons between the guides from the leading carton at the discharge end of the guide.

4,518,302
SYSTEM AND PROCESS FOR AUTOMATIC STACKING, STORAGE AND WITHDRAWAL OF PACKAGED MERCHANDISE IN LARGE WAREHOUSES

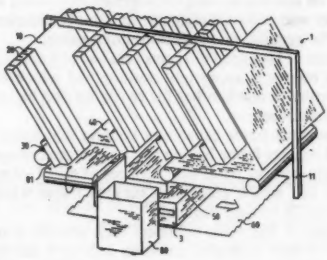
Gunter Knapp, Hart-St. Peter, Fed. Rep. of Germany, assignor to Ing. G. Knapp Ges.mgH & Co. KG, Fed. Rep. of Germany

Filed Apr. 6, 1983, Ser. No. 482,528

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3213119

Int. Cl.³ B65G 1/02

U.S. Cl. 414—273 **17 Claims**



1. A computer-controlled handling process for automatically stacking, storing and removing various types of packaged merchandise items from large warehouse installations, wherein the merchandise items are withdrawn in sequence from respective magazines associated with several shelves and loaded into passing transport containers, comprising the steps of: in a warehouse installation including a plurality of shelves which are subdivided into successively arranged blocks, the shelves of each block being associated with the respective product magazines, loading the various types of merchandise items into the product magazines while simultaneously removing the merchandise items from the shelves of a certain block by ejecting the merchandise items from the magazines associated with that certain block by a remote-controlled ejection device when a transport container has arrived at a block preceding that certain block, collecting and then simultaneously loading the merchandise items into the transport container when the latter arrives at the certain block and causing the transport container to continue its movement immediately after having been loaded, and wherein the speed of the transport container is adjusted to substantially correspond to the sum of the ejection, collection and loading times so that removal of the merchandise items takes place in a minimal time.

4,518,303
MOVABLE FLOOR SELF-UNLOADING TRAILER

William H. Moser, Paris, Tex., assignor to Jerel J. Barham, Paris and Lynaveta Clegg, Roanoke, both of, Tex., part interest to each

Filed Apr. 6, 1983, Ser. No. 482,423

Int. Cl.³ B60P 1/38

U.S. Cl. 414—528 **3 Claims**

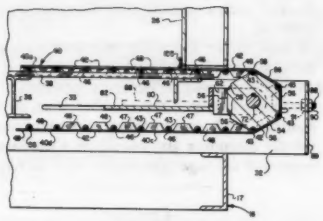
1. A self unloading vehicle bed comprising:

a frame adapted to be supported by an undercarriage;

a movable load supporting floor supported on said frame, said floor including a load support portion comprising a plurality of floor plate members extending the full transverse length of said load support portion, said floor plate members each including bearing means engageable with cooperating bearing means on said frame and hinge bearing portions for receiving elongated hinge pins for interconnecting said floor plate members with each other seriatim;

a drive shaft disposed on said frame at one end thereof and an idler shaft disposed on said frame at the opposite end thereof, said drive shaft and said idler shaft each supporting spaced apart sprockets thereon, said sprockets each having a polygonal cross section and circumferentially spaced apart recesses formed on the periphery of said sprockets for driving engagement with said hinge bearing portions of said floor plate members, respectively;

said load support portion of said floor extending at least between both of said sprockets in the normal full load bearing position of said floor to form an upper run of said floor, and said floor including a plurality of connecting plate members extending between opposite ends of said load support portion and being interconnected to said load support portion and to each other to form a lower run of said floor, said connecting plate members being of a configuration corresponding to said floor plate members and



of a transverse length substantially less than said floor plate members, said connecting plate members being interconnected by complementary hinge bearing portions drivably engageable with at least one of said drive and idler sprockets, respectively; and

means for rotating said drive shaft to traverse said upper run comprising said load support portion of said floor and said connecting plate members comprising said lower run in opposite directions over said drive and idler sprockets, respectively, for traversing said load support portion along said upper run during loading and unloading operations and to provide for access to said bearing means on said frame between said sprockets along said upper run, and to provide access to said bearing means on said floor plate members.

4,518,304
LOAD HANDLING APPARATUS

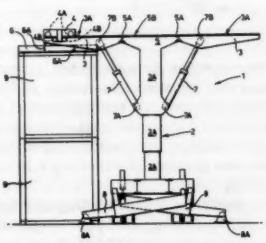
Michael I. Blatchford, Oakhill, Nr. Shepton Mallet, England, assignor to Ralph Blatchford & Company Limited, Avon, England

Filed Feb. 25, 1983, Ser. No. 469,713

Claims priority, application United Kingdom, Mar. 4, 1982, 8206338

Int. Cl.³ B60P 1/54

U.S. Cl. 414—542 **6 Claims**



1. Load handling apparatus, including:

a road vehicle and load moving means on the vehicle for moving a load laterally of the vehicle, the load moving

means being not greater in width than the width of the vehicle,

wherein the load moving means comprises:

two spaced load moving structures each of which has a vertically extendible pedestal;

each said pedestal having an upper vertically movable member;

each said load moving structure having at least one arm which in an operative position extends substantially horizontally outwardly from the respective said pedestal;

said at least one arm supporting a device for conveying a load in a direction laterally of the vehicle;

each said arm being turnable downwardly in a substantially vertical plane so that in said inoperative position thereof, such arm is disposed alongside a respective said pedestal;

each said upper vertically movable member having a horizontally extending top member;

each said arm being so pivotally mounted at an end of a corresponding said top member, that, in an operative position, each top member and each respective outwardly extending arm constitute a trackway; and

a respective carriage running on each said trackway.

4,518,305

VEHICLE-MOUNTED APPARATUS FOR SUPPORTING BALLAST WEIGHTS AND FOR ELEVATING THE WEIGHTS

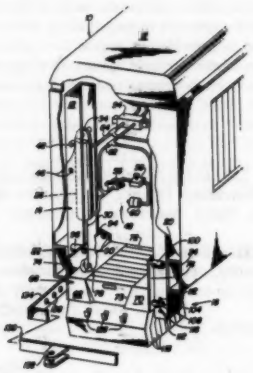
Heinz Stuhrmann, Schwetzingen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Dec. 6, 1982, Ser. No. 446,934

Claims priority, application European Pat. Off., Dec. 29, 1981, 81110815.8

Int. Cl.³ B66F *9/00*

U.S. Cl. 414—719 **10 Claims**



1. A tractor-mounted apparatus for supporting ballast weights thereon and for vertically raising and lowering said weights relative to the ground, said apparatus comprising:

(a) a pair of U-shaped channels fastened to frame members of said tractor in an upright position and which are aligned opposite to one another for receiving said ballast weights therebetween;

(b) a support frame capable of holding said ballast weights, said support frame having two pairs of spaced apart rollers which contact outer side surfaces of said U-shaped channels and which guide said support frame while moving vertically on said channels;

(c) a pair of hydraulic cylinders each secured at one end to one of said U-shaped channels and each having an outwardly extending piston rod detachably coupled at an outer end to opposite sides of said support frame;

(d) locking means for affixing said support frame to said U-shaped channels in at least one vertical position and for enabling detachment of said hydraulic cylinders from said support frame so that said outwardly extending piston rods can be attached to an implement; and

(e) control means for moving said piston rods into and out of said hydraulic cylinders thereby raising and lowering said ballast weights or attached implement with respect to the ground in a substantially vertical fashion.

8. A tractor-mounted apparatus capable of supporting ballast weights on said tractor and for alternatively raising and lowering either said ballast weights or an attached implement relative to the ground, said apparatus comprising:

(a) a pair of U-shaped channels fastened to frame members of said tractor in an upright position and which are aligned opposite to one another for receiving said ballast weights therebetween;

(b) a support frame capable of holding said ballast weights, said support frame having two pairs of spaced apart rollers which contact outer side surfaces of said U-shaped channels and which guide said support frame while moving vertically on said channels;

(c) a pair of hydraulic cylinders each secured at one end to one of said U-shaped channels and each having an outwardly extending piston rod detachably coupled at an outer end to opposite sides of said support frame; and

(d) control means for moving said piston rods into and out of said hydraulic cylinders thereby raising and lowering said ballast weights or attached implement with respect to the ground in a substantially vertical fashion, said control means including a four-way four position valve connected between a pressure source and both hydraulic cylinders, a first fluid line connecting rod chambers of said hydraulic cylinders to said four-way valve, a second fluid line connecting head chambers of said hydraulic cylinders to said four-way valve, a two-way two position valve connected to said first line, a throttle valve located downstream of said two-way valve and an accumulator located downstream of said throttle valve, said control means functioning to lower said weights relative to the ground when both said four-way and two-way valves are in a first position, to provide a hydraulic damping effect to said tractor when both said four-way and two-way valves are in a second position, to provide a hydraulic lock on said weights when said four-way valve is in a third position and said two-way valve is in a first position, and to raise said weights relative to the ground when said four-way valve is in a fourth position and said two-way valve is in a first position.

4,518,306

DEVICE IN A BUCKET-PROVIDED LOADING MACHINE PARTICULARLY A SO-CALLED WHEEL LOADER

Jan-Erik Rova, Lärkvägen 20, S-981 37 Kiruna, Sweden

PCT No. PCT/SE82/00394, § 371 Date Jul. 22, 1983, § 102(e) Date Jul. 22, 1983, PCT Pub. No. WO83/01973, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 23, 1982, Ser. No. 527,647

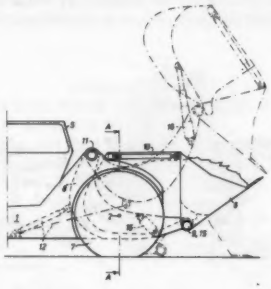
Claims priority, application Sweden, Nov. 24, 1981, 8106990

Int. Cl.³ E02F *3/64*

U.S. Cl. 414—726 **4 Claims**

1. In a bucket-equipped loading machine, particularly a so-called wheel loader, which has a loading bucket at one end of the machine, the bucket being supported for raising and lowering movements by a pair of lift arms which are journalled in the machine, the bucket furthermore being pivotally connected with the free ends of the arms and lockable in position relative thereto, the bucket at the side thereof facing the machine being at least partly open and connected with a rear bucket portion which is located between the lift arms and

which extends in between the adjacent wheels of the machine, the improvement comprising said rear bucket portion being separately pivotably and lockably connected with said lift arms on an axis parallel to and coinciding with the pivot axis of the



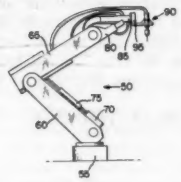
load bucket and said lift arms being curved downwardly and forwardly and adapted to form a support during loading and transport for said rear bucket portion, said rear bucket portion resting on and having a curved shape corresponding to said support formed by said lift arms.

4,518,307

COMPLIANT ROBOT ARM ADAPTER ASSEMBLY

Joseph T. Bloch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1982, Ser. No. 426,357
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—729 **7 Claims**



1. A compliant adapter assembly useful with an articulatable robot arm requiring an accessory, said adapter assembly comprising:

means for mounting said adapter assembly to said arm, said mounting means having a plate provided with an opening;

a first ring positioned within said opening,

means for pivotably connecting said first ring to said mounting means while allowing translation of said first ring with respect to said mounting means,

a first spring means positioned between said first ring and said mounting means,

a second ring disposed within said first ring,

means for pivotably connecting said second ring to said first ring while allowing translation of said second ring with respect to said first ring,

a second spring means positioned between said first ring and said second ring,

a motor carried by said second ring, said motor having an output shaft;

means for biasing said motor towards a position which is substantially perpendicular to said plate, said biasing means comprising a plurality of orthogonally disposed springs carried between said motor and said plate, and

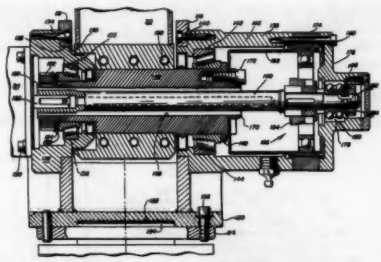
holding means connected to said output shaft for attaching an accessory to said adapter assembly, said holding means being capable of translation along the longitudinal axis of said output shaft.

4,518,308

MANIPULATOR APPARATUS

Bohdan Grzybowski, Highland Park, and Mark T. Horbal, Warrenville, both of Ill., assignors to Acrobe Technology Inc., St. Petersburg, Fla.

Filed Mar. 1, 1982, Ser. No. 354,780
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—735 **10 Claims**



1. Manipulator apparatus comprising a plurality of elongated members serially interconnected by motion joints and defining a manipulator arm terminating in a terminal motion actuator having mounting means adapted to receive an article handling member, a motion actuator associated with each motion joint, each of said motion actuators having a power unit responsive to control pulses and a motion reducing unit for reducing the motion output of said power unit, the power unit and the motion reducing unit of each motion actuator being spaced from each other and mounted on opposite sides of the respective motion joint, means for demountably supporting said power and motion reducing units on said respective motion joint, and a movement coupling means for coupling together the respective power and motion reducing units, each of said power units comprising a DC stepping motor and each of said motion reducing units comprising a harmonic drive device, said terminal motion actuator having a terminal power unit responsive to control pulse for actuating said mounting means.

4,518,309

HIGH SPEED PIPE HANDLING APPARATUS

Joe R. Brown, P.O. Box 19310, 5649 Tupper Lake, Houston, Tex. 77056

Continuation-in-part of Ser. No. 258,923, Apr. 30, 1981, Pat. No. 4,444,536, which is a continuation-in-part of Ser. No. 35,933, May 4, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,708
Int. Cl.³ B66F *11/02*
U.S. Cl. 414—745 **25 Claims**

1. Apparatus for manipulating pipe members comprising:

a. gripping means selectively movable generally transversely to such pipe member between a retracted configuration, in which said gripping means may grippingly engage such pipe member, and an extended configuration in which said gripping means is free from gripping engagement with said pipe member;

b. propulsion means selectively operable in response to fluid pressure for so selectively moving said gripping means between said retracted and extended configurations, and including cylinder means for receiving such fluid pressure and piston means, circumscribed by said cylinder means and connected to said gripping means and movable therewith in response to said fluid pressure to thereby so selectively move said gripping means;

c. said piston means including piston head means cooperating with said cylinder means for providing first fluid

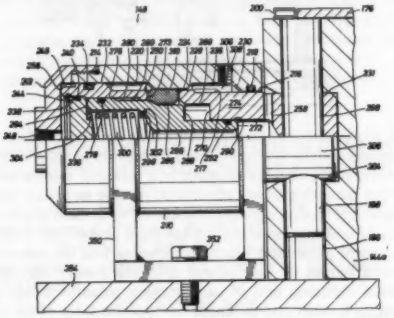
pressure chamber means, and further including internal chamber means;

d. latch means carried by said piston means, and radially movable relative thereto between an extended configuration, in which said latch means may reside at least in part in profile means within said cylinder means to releasably lock said piston means relative to said cylinder means to limit axial movement therebetween whereby said gripping means may be locked in said retracted configuration, and a retracted configuration in which said latch means is not within said profile means;

e. control means movable longitudinally within said internal chamber means between a first position, in which said control means maintains said latch means in said extended configuration of said latch means, and a second position in which said control means permits said latch means to be in said retracted configuration of said latch means;

f. biasing means for urging said control means toward said first position; and

g. second fluid pressure chamber means defined, at least in



part, by said cylinder means, said piston means and said control means;

h. wherein application of fluid pressure to said first fluid pressure chamber means may propel said piston means to move said gripping means to said retracted configuration of said gripping means whereby said biasing means may move said control means to said first position to maintain said latch means in said extended configuration of said latch means within said profile means to thereby automatically, releasably lock said gripping means in said retracted configuration of said gripping means, and wherein application of fluid pressure to said second fluid pressure chamber means may propel said control means to said second position, permitting said latch means to move to said retracted configuration of said latch means to release said gripping means from being locked in said retracted configuration of said gripping means and whereupon said application of fluid pressure to said second fluid pressure chamber means may propel said piston means to move said gripping means to said extended configuration of said gripping means.

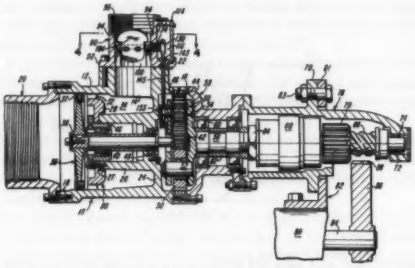
4,518,310

APPARATUS FOR PREVENTING OVERSPEED OF A TURBINE DRIVE MEANS

Terry L. Coons, Dayton, Ohio, assignor to Tech Development Inc., Dayton, Ohio

Filed Sep. 3, 1982, Ser. No. 414,625
Int. Cl.³ F01B *17/06*
U.S. Cl. 415—36 **7 Claims**

1. A turbine assembly including a housing, a rotor within said housing having a drive system in connection therewith and forming a part thereof, means defining a flow path for the delivery of gaseous fluid under pressure and the application thereof to power said rotor characterized by valve means, control means in connection with a component part of said drive system, said control means including an element having an orientation which is substantially radial to said component part, means constructed and arranged to normally hold said element in a relatively retracted position with reference to said part and to provide for its substantially radial movement outwardly of said component part in a substantially instantaneous



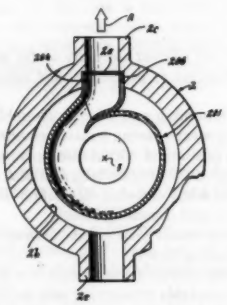
response to the speed of rotation of said rotor exceeding a predetermined limit, to condition said valve means to move across and to obstruct at least a portion of said flow path sufficiently to diminish the application of said fluid to power said rotor and produce an immediate reduction of its speed of rotation and that of its drive system and correspondingly that of said component part thereof without interrupting the application of power to said rotor.

4,518,311

CENTRIFUGAL PUMP

Robert Dernedde, Frankenthal; Hans-Joachim Franke, Grünstadt, and Peter Havekost, Bobenheim, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,294
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940058
Int. Cl.³ F04D *29/40*
U.S. Cl. 415—102 **28 Claims**



1. In a centrifugal pump, particularly in a high pressure pump for use in power plants or the like, the combination of a casing including an inner section having an internal passage for the flow of a fluid therethrough, and an outer section surrounding and being detachably connected to said inner section and having another passage for the flow of a fluid therethrough; rotor means in said casing; sealing means interposed between said sections and including an extension establishing fluid communication between said internal passage and said other passage, said extension being fixed to said inner section

and being radially freely movable relative to said outer section to thereby permit relatively uninhibited differential thermal expansion of said sections; and means for suspending said inner section in said outer section, said suspending means engaging said outer section radially outwardly of the axis of said rotor means, and said suspending means bein disposed outwardly of said rotor means as considered in the axial direction of the latter.

4,518,312

DUAL FOLD TAIL VANE ASSEMBLY FOR WIND ENERGY SYSTEMS

Marcellus L. Jacobs, and Paul R. Jacobs, both of Fort Myers, Fla., assignors to Jacobs Wind Electric, Plymouth, Minn.

Filed Mar. 7, 1983, Ser. No. 473,150
Int. Cl.³ F03D *7/04*
U.S. Cl. 416—13 **4 Claims**

1. An improvement in a means for protecting a wind energy plant against damage thereto caused in high winds, wherein the wind energy plant comprises:

a generator supported with the shaft projecting vertically upwards;

a hypoid gear drive means having a gear case, a substantially horizontal input shaft journaled in the gear case, an output shaft journaled in the gear case and whose axis is oriented vertically offset a predetermined distance from the input shaft axis, and a pair of hypoid gears, one of each carried by each shaft within the gear case in meshing engagement with each other for transferring power from the input to the output shaft, and said output shaft mounted concentrically on the generator shafts;

a propeller assembly fixed on the input shaft to transfer wind generated torque to the input shaft, said propeller assembly including a variable pitch speed control governor for increasing the pitch of the propellers of said propeller assembly in response to increased propeller assembly speed in a manner such that propeller assembly speed does not exceed a predetermined maximum;

a tail vane assembly having an axis running along its long dimension;

pivot means pivotally connecting said gear case to the tail vane assembly about a vertical axis, said tail vane assembly being held with its axis substantially parallel to the wind direction by wind passing through the propellers, and further including a first pivot control means connected between the gear case and the tail vane assembly for providing a first predetermined resistance against pivoting by the gear case in a first direction with respect to the tail vane assembly, said pivoting force in the first direction being generated by the windage force on the propeller assembly directed parallel to the axis of the tail vane assembly and offset with respect to the output shaft axis; wherein the improvement comprises

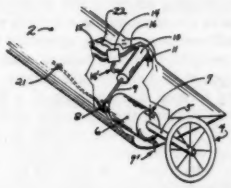
a second pivot control means connected between the gear case and the tail vane assembly for providing a second predetermined resistance against pivoting by the gear case opposite to the first direction with respect to the tail vane assembly, said second predetermined resistance being substantially greater than the first predetermined resistance, wherein the application during high winds of torsional drag to the output shaft of the gear drive sufficient to reduce the speed of the propeller assembly and thereby reduce feathering thereof increases wind generated propeller assembly torque on the gear drive input shaft sufficient to create reaction torque urging the gear case to pivot opposite the first direction relative to the tail vane assembly and exceed the windage-generated torque urging the gear case to pivot in the first direction relative to the tail vane assembly, and wherein said second pivot control means opposes the excess of said torque pivoting the gear case opposite to the first direction relative to the tail vane assembly.

4,518,313

WIND BLADE VIBRATION ELIMINATOR FOR HELICOPTERS

Ronald N. Jensen, 208 Greenwell Dr., and John A. Walker, 1005 Todds La., both of Hampton, Va. 23666

Filed Feb. 25, 1982, Ser. No. 352,228
Int. Cl.³ F03D *7/02;* **B64C** *27/72*
U.S. Cl. 416—18 **10 Claims**



1. In combination with a helicopter airfoil, a vibration eliminator attached to said airfoil and consisting of a pivoted gyro positioned with the gyro rotating axis nominally parallel to the length of the airfoil and the gyro pivot axis generally parallel to the airfoil rotaing axis,

means to impose rotation to said gyro,

means to position said gyro relative to said airfoil, and

means to provide control signal to the means to position said gyro,

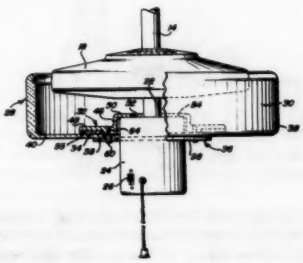
whereby the variable torque forces caused by the variable precession gyro can be transmitted to said airfoil and said means to position gyro varies said gyro axis relative to said airfoil thereby changing the rate of precession in response to said control signal, counteracting various bending forces on said airfoil caused by various velocities of said airfoil through the air.

4,518,314

DECORATIVE FAN MOTOR COVER AND MOUNTING STRUCTURE THEREFOR

Charles R. Schultz, 6616 Central Ave. SE., Albuquerque, N. Mex. 87108

Filed Nov. 30, 1983, Ser. No. 556,592
Int. Cl.³ F04D *29/32, 29/64*
U.S. Cl. 416—93 R **5 Claims**



1. In combination win an existing ceiling fan including a

ceiling mounted depending first support portion, a fan motor housing mounted from said first support portion, a blade equipped motor rotor journalled from an upper portion of said motor housing, a second slender support portion depending below said motor housing and supporting a horizontally enlarged motor controlling switch housing therefrom, a decorative housing assembly for said motor housing, said decorative housing assembly including, outwardly projecting mounting flange means supported from an upper portion of said switch housing, said mounting flange means including a downwardly opening inverted cup-shaped housing body including a centrally apertured upper end wall and a lower end radially outwardly projecting flange, said body, including said upper end wall and mounting flange, having a radial slot formed therein of a width at least equal to the transverse dimension of said second support portion whereby the latter may be received through said slot, said body being removably laterally engaged with said second support portion and downwardly telescoped over the upper portion of said switch housing with upper end of said switch housing abutting the underside of said upper wall, a decorative cover including a bottom wall and upstanding periphal wall means projecting upwardly from and extending about the periphery of said bottom wall, said decorative cover being open at its top and said bottom wall including a central opening formed therethrough of a size to snugly receive said switch housing therethrough, said cover being upwardly displaced over the lower portion of said switch housing to a position with the open top of said cover at least partially upwardly telescoped over said fan motor housing from therebelow and with the inner periphery of said bottom wall at least closely opposing said mounting flange means, and retaining means releasably anchoring said bottom wall relative to said mounting flange means, said retaining means comprising a generally annular retaining flange assembly underlying the inner periphery of said bottom wall, and elongated shank-type fastener means peripherally spaced about and secured upwardly through said annular retaining flange assembly, passing upwardly through said central opening inwardly of the periphery thereof and anchored relative to said mounting flange means.

4,518,315

ARRANGEMENT FOR CONNECTING A CERAMIC ROTOR WHEEL, PARTICULARLY A TURBINE ROTOR WHEEL OF A TURBOMACHINE, SUCH AS A GAS TURBINE ENGINE, TO A METALLIC SHAFT

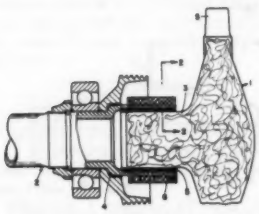
Wolfgang Krüger, Reichertshausen, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,061

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129220

Int. Cl.³ F01D *5/28, 5/30*

U.S. Cl. 416—241 B **10 Claims**



1. In an arrangement for interconnecting a ceramic rotor wheel, particularly a turbine rotor wheel of a turbomachine, such as a gas turbine engine, with a metallic shaft, said connection being formed between the shaft journal of the ceramic rotor wheel and a tubular end portion of the metallic machine shaft assembled therewith, the improvement comprising a ring constituted of a thermally insulating material being seated on the shaft journal of the ceramic rotor wheel on which there is positioned the tubular end portion of the metallic machine shaft so as to extend intermediate said tubular end portion of the machine shaft and the shaft journal of the rotor wheel; and at least one fiber ring having a coefficient of thermal expansion lower than that of the shaft journal of the ceramic rotor wheel to form a positive connection of the shaft end portion on the shaft journal, said fiber ring being press-fitted onto the end portion of the shaft and exerting a radial compressive force against the facing surfaces of said end portion of the shaft, said ring of thermally insulating material and said shaft journal to provide a rotationally symmetrical formfitted connection between the facing surfaces of said components.

4,518,316

PRESSURE SUSTAINING APPARATUS

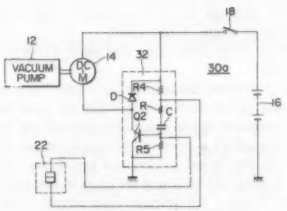
Mitsuyoshi Yokota, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,736

Claims priority, application Japan, Sep. 10, 1982, 57-138510[U]

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—12 **12 Claims**



1. A pressure sustaining apparatus comprising:

a pressure generating means for generating a pressure which is different from atmospheric pressure when energized;

a sensor for providing an output signal when the absolute value of the gauge pressure generated by said pressure generating means falls below a predetermined threshold value; and,

a control circuit for energizing said pressure generating means when the output signal from said sensor is provided, said control circuit including means for continuously energizing said pressure generating means for a predetermined length of time after the output signal from said sensor is terminated;

wherein said pressure generating means includes a DC motor connected to said control circuit;

wherein said sensor has contacts which are opened when the negative value of the gauge pressure generated by said pressure generating means exceeds said predetermined threshold value;

wherein said continuously energizing means comprise a timer circuit, consisting of a resistor and a capacitor, connected across said sensor;

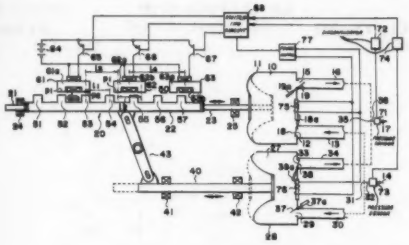
further comprising a DC power source connected to said DC motor and a diode connected to the positive terminal of said DC power source;

and wherein said control circuit further includes a first transistor having its base connected to one end of said timer circuit, having its collector connected through a parallel combination of said diode and said DC motor to the positive terminal of said DC power source, and having its emitter connected to ground.

4,518,317
FLUID PUMPING SYSTEM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 12, 1983, Ser. No. 523,039
Claims priority, application Japan, Aug. 12, 1982, 57-140354
Int. Cl.³ F04B *49/06, 43/04, 17/04;* H02K *41/02*
U.S. Cl. 417—45 10 Claims



1. A fluid pumping system comprising:

a fluid-reception chamber having an inlet conduit leading from a fluid source site and an output conduit leading to a fluid delivery site;

an elongate plunger means drivingly connected with said chamber and linearly reciprocable along its longitudinal axis so as to alternately expand and contract a volume of said chamber, thereby alternately drawing a fluid therein through said inlet conduit from said source site and pumping the fluid through said outlet conduit towards said delivery site; and

electromagnetically operated drive means for effecting said linear reciprocation of the plunger means at a rate of reciprocation in the range between 0.01 and 10 Hz, said electromagnetically operated drive means including:

an elongated member formed on said plunger means and comprised of magnetic material, said member being formed along one lateral surface with a plurality of equidistantly spaced magnetic teeth defining a row of such teeth,

a plurality of magnetic flux generators disposed in a row opposite said row of teeth, each of said magnetic generators comprising a U-shaped core member having a pair of pole pieces confronting said row of teeth, the spacing between the pole pieces along said row of magnetic flux generators differing from the spacing of said teeth, and respective coils on each of said cores excitable electrically to generate respective magnetic fields at said cores, and

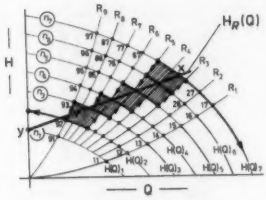
a switching circuit connected to said coils for electrically exciting same in a predetermined sequence to displace said member in one and the opposite longitudinal direction.

4,518,318
PUMPING SETS

Niels D. Jensen; Kurt F. Nielsen, both of Bjerringbro, and Bent Larden, Rodkaersbro, all of Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Jul. 7, 1983, Ser. No. 511,794
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—53 3 Claims

1. A method of determining operational parameters in a pumping set the rotary speed of which is controlled, said pumping set comprising an electric motor and a rotary pump driven by the same, the speed of revolution n of which is regulated as a function of selected operating parameters of the set, in steps within the ambit of a characteristic range, the limits of which are determined on the one hand by two modulation graphs H(Q) for the maximum and minimum r.p.m. figures and on the other hand by the co-ordinates delivery head and delivery flow, a particular partial path being settable on each of the modulation graphs H(Q) applicable for the constant r.p.m. figures n_i in order to initiate an r.p.m. switching action upon reaching the electrical operating parameters of the set which are representative for the terminal values of the partial paths, by lowering the r.p.m. if the one terminal value is reached on one partial path with the greater delivery head and the lesser delivery flow Q, and increasing the same if the other terminal



value is reached on this partial path with the lesser delivery head H and the greater delivery flow Q, the invention which consists in that the r.p.m. switching actions are controlled in dependency on the situation of an imaginary control characteristic optionally preselected for the particular case of application of the set and plotted through partial paths of the modulation graphs and that the r.p.m. switching action is initated upon reaching the electrical parameters representative for the terminal values of the partial paths, by lowering the

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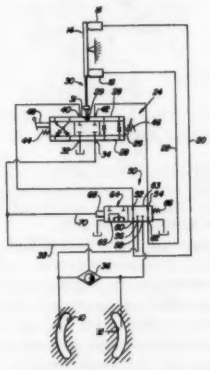
4,518,319
VARIABLE DISPLACEMENT PUMP SYSTEM

Curtis P. Ring, Calgary, Canada, assignor to Deere & Company, Moline, Ill.

Filed Feb. 3, 1984, Ser. No. 576,686
Int. Cl.³ F04B *1/26*
U.S. Cl. 417—217 7 Claims



1. A hydraulic system comprising:

a bi-directional variable displacement pump having high and low pressure workports and having first and second pressure-responsive displacement control pistons for controlling the displacement thereof;

an operator-controlled stroke control valve for generating fluid pressure stroke control signals at first and second outputs thereof;

an override valve connected in series between the stroke control valve outputs and the displacement control pistons and movable in response to pump workport pressure

from a first position wherein the first and second stroke control valve outlets are communicated to the first and second control pistons, respectively, to a second position wherein communication between the stroke control valve outputs and the first and second control pistons is blocked and wherein the pump workports are communicated to the first and second control pistons to reduce pump displacement; and

resilient means biased to urge the override valve to its first position.

4,518,320

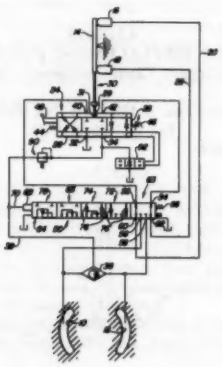
VARIABLE DISPLACEMENT PUMP SYSTEM

Bradley D. Goodell, Anoka, Minn., assignor to Deere & Company, Moline, Ill.

Filed Feb. 3, 1984, Ser. No. 576,688

Int. Cl.³ F04B 49/00

U.S. Cl. 417—217 **5 Claims**



1. A hydraulic system comprising:

a variable displacment pump having high and low pressure workports and pressure-responsive displacement control means for controlling the displacement thereof;

an operator-controlled stroke control valve having a pair of outlets communicated with the displacement control means, a low pressure inlet connected to a reservoir, a high pressure inlet and a valve member movable to control communication between the inlets and outlets, thereby generating fluid pressure stroke control signals at the outlets, the valve member having a neutral position wherein the outlets and inlets are blocked, the stroke control valve comprising a spring-centered, operator-actuatable spool movable within a follower sleeve, the follower sleeve sensing swashplate position via a position feedback linkage, the neutral bypass valve being formed out of an extension of the follower sleeve; and

a neutral bypass valve for communicating the high pressure inlet to the reservoir when the valve member of the stroke control valve is in its neutral position.

4,518,321

POWER REGULATION DEVICE FOR A HYDRAULIC PUMP

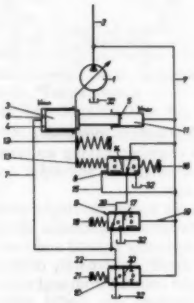
Reinhold Schniederjan, Neu-Ulm, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,557

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232695

Int. Cl.³ F04B 49/00

U.S. Cl. 417—218 **6 Claims**



1. In a power regulation device for a hydraulic pump which generates a pump pressure for producing an adjustable discharge of a working fluid supplied to a load, said device comprising:

measuring spring means;

power valve means including control slider means connected to said measuring spring means;

adjustable hydraulic means including slidable piston means connected to said pump, the position of said slidable piston means controlling said discharge and said slidable piston means being biased in one direction by an adjustable fluid pressure and in an opposite direction by said measuring spring means, said measuring spring means also biasing said control slider means in a given direction, said power valve means controlling said adjustable fluid pressure acting upon said slidable piston means, and said control slider means being biased in said given direction by said pump pressure; and

pilot valve means for adjusting the regulating device towards a condition for zero pump discharge;

the improvement wherein:

said device further comprises power spring means biasing said control slider means in a direction opposite said given direction, thus opposing the bias exerted on said control slider means by said measuring spring means;

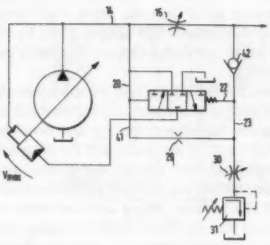
adjustment of the regulating device towards a condition for reduced pump discharge is effected by reducing said adjustable fluid pressure acting on said slidable piston means; and

said pilot valve means reduces said adjustable fluid pressure acting on said slidable piston means substantially to zero during a no-load condition of said pump.

4,518,322
ARRANGEMENT FOR REGULATING A SUPPLY FLOW AND FOR LIMITING A SUPPLY PRESSURE OF AN ADJUSTABLE PUMP

Gerhard Nonnenmacher, Korntal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,925
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906166
Int. Cl.³ F04B *1/26*
U.S. Cl. 417—222 **3 Claims**



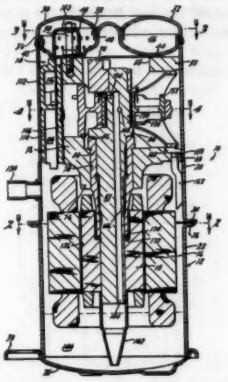
1. An arrangement for regulating supply flow and limiting supply pressure in a supply conduit means of an adjustable pump, comprising an adjusting member coupled to said pump and having a first inlet and a second inlet for a pressure fluid; first throttling element in the supply conduit; a flow regulating valve having a common port, a first switching port connected to the supply conduit upstream of the first throttling means and a second switching port connected to a tank; a non-return valve connecting one end of the flow regulating valve to said supply conduit downstream of the first throttling means, said one end being biased by a spring to displace the valve into a first working position in which the first switching port is connected to the common port, and the other end of the flow regulating valve being connected to said supply conduit upstream of said first throttling element to displace the regulating valve into a second working position in which the common port is connected via the second switching port to the tank; the adjusting member cooperating with said pump and having one inlet connected to said supply conduit upstream of the first throttling element and a counteracting inlet connected to the common control port of the flow regulating valve; a spring biased preliminary control valve having an outlet connected to the tank, and an inlet; a second throttling element connected between said supply conduit upstream of the first throttling means and said one end of the flow regulating valve; and a third throttling element connected between said one end of the flow regulating valve and said inlet of said preliminary control valve.

4,518,323
HERMETIC REFRIGERATION COMPRESSOR

John P. Elson; Earl B. Muir, and Delmar R. Riffe, all of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Jul. 25, 1983, Ser. No. 516,774
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—312 **25 Claims**

1. A motor compressor comprising:
an outer shell having a lubricant sump containing a supply of lubricant in the bottom thereof;
motor means within said shell and
compressor means within said shell, said compressor means including a housing defining a substantially closed crankcase, a piston reciprocably disposed within a cylinder defined by said housing, main bearing means rotatably journalling a crankshaft in said housing, said crankshaft being driven by said motor means and drivingly connected to said piston means via piston bearing means, said crankshaft having a lower end thereof immersed in said lubricant;
axially extending oil passage means in said crankshaft for conducting lubricant from said sump to said main and piston bearing means;
vent passage means in said crankshaft opening into said crankcase and communicating with the end of said oil passage means remote from said sump; and



valved vent means extending between said substantially closed crankcase and the interior of said shell, said valved vent means being operative to vent said crankcase to said interior in response to pressure pulses within said crankcase from reciprocating movement in said piston to maintain said crankcase at a pressure substantially equal to or less than said interior, whereby the end of said oil passage remote from said sump is subjected to a pressure below that of said interior via said vent passage thereby aiding oil flow through said passage to said bearings.

4,518,324
SEALED TYPE ELECTRICALLY OPERATED COMPRESSOR

Takao Mizuno; Naoshi Uchikawa; Akira Murayama, and Takahiro Tamura, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,938
Claims priority, application Japan, Apr. 9, 1982, 57-58082
Int. Cl.³ F04B *35/04, 39/06;* F04C *18/04*
U.S. Cl. 417—366 **7 Claims**

1. An electrically operated compressor of a sealed type comprising:
a sealed container of a cylindrical shape;
a compressor section and an electric motor section contained in said sealed container;
said compressor section comprising a stationary scroll member including an end plate secured to an upper end portion of said sealed container, and a spiral wrap disposed in upright position on the end plate, an orbiting scroll member including an end plate and a wrap of essentially the same shape as the end plate and the wrap of the stationary scroll member, and a frame connected to the stationary scroll member in a manner to enclose the orbiting scroll member between the frame and the stationary scroll member;
said electric motor section being located below said compressor section and comprising a stator secured to a lower portion of said sealed container, and a rotor secured to a lower portion of a crankshaft journaled by bearing por-

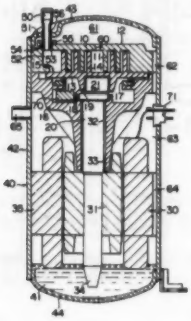
tions of said orbiting scroll member and of said frame of said compressor section;

a member for preventing said orbiting scroll member from rotation on its own axis during its orbiting movement, and being mounted between the frame and the orbiting scroll member;

an oil sump in a bottom portion of said sealed container of the cylindrical shape to allow oil feeding means formed in a lower portion of said crankshaft to be immersed in oil;

a discharge passage extending through the end plate of the stationary scroll member to discharge compressed fluid at a high pressure into an upper space in said sealed container;

a suction pipe defining a suction passage extending through



said upper space and having two end portions, one of said two end portions extending through the end plate of the stationary scroll member to open in a fluid suction space defined between the stationary scroll member and the orbiting scroll member in meshing engagement with each other and the other end portion axially extending through a wall of said sealed container of cylindrical shape to communicate with an outer equipment on the lower pressure side, said suction pipe being secured to one of the end plate and the wall of the container and connected in non-secured condition to the other of the end plate and the wall of the container; and

a gas sealing member disposed between said suction pipe and the other of the end plate of the stationary scroll member and the wall of the container.

4,518,325

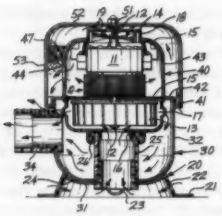
AERIFYING DEVICE FOR WHIRLPOOL BATH OR TUB

James E. Kingston, 1108 McRae Rd., Arlington, Wash. 98223

Filed Jul. 11, 1983, Ser. No. 512,863

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—368 **5 Claims**



1. For use with a by-pass vacuum motor having:

an axial drive shaft;

electrically-powered workings for rotating the drive shaft;

blower means driven by rotation of the drive shaft and carried at one end portion thereof for supplying a primary flow of air;

a blower casing separating the electrically-powered workings from the blower means, enclosing the blower means and having an air inlet for intake of air into such casing generally axially of the drive shaft at the blower means end of the drive shaft and air outlet means for discharging air from such casing generally radially of the drive shaft; and

fan means mounted outside the blower casing and driven by rotation of the drive shaft for supplying a secondary flow of air to cool the electrically-powered workings;

the improvement comprising a housing for mounting the by-pass vacuum motor with its axial drive shaft upright and its blower means at the bottom and adapting the by-pass vacuum motor for use as an aerifying device for baths or tubs, said housing comprising:

a bowl portion having an upright peripheral wall encircling the blower casing and extending downward a substantial distance below the blower casing, said bowl portion having an air inlet and an air outlet and forming a first plenum for air discharged from the blower casing; and

an air inlet conduit having one end portion sealed around the air inlet of the blower casing and the other end portion sealed around the air inlet of said housing bowl portion, said air inlet conduit extending through the first plenum formed by said bowl portion for conveying air from outside said bowl portion to the blower casing air inlet.

4,518,326

HERMETIC MOTOR COMPRESSOR FOR REFRIGERATION SYSTEMS AND THE LIKE

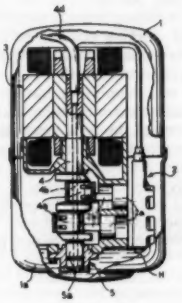
Federigo Peruzzi, and Marek Zgliczynski, both of Turin, Italy, assignors to Aspera A.p.A., Italy

Filed Sep. 7, 1982, Ser. No. 415,299

Claims priority, application Italy, Sep. 7, 1981, 68176 A/81

Int. Cl.³ F04B *39/06, 35/04*

U.S. Cl. 417—372 **1 Claim**

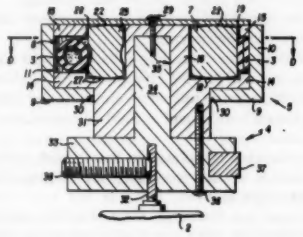


1. Hermetic motor compressor for refrigeration systems and the like, of the type comprising a hermetic casing in which are mounted a reciprocating compressor and a reversible electric motor having a common vertical shaft with an axial duct for conveying lubricating oil from a centrifugal pump located at the lower end of the shaft to an outlet at its upper end, wherein the outlet of the axial duct is constituted by an elbow tube which is fixed to the upper end of the shaft and has an end portion extending upwardly and radially outwardly with respect to the axis of the shaft and wherein the end portion of the elbow tube is tapered so as to have a section which decreases in area towards its free outlet end with the free outlet end of the elbow tube having a central part which is flattened in the general plane of inclination of the end portion to define two tubular parts which define respective nozzles located side-by-side in the path of rotation of the free outlet end.

4,518,327
ROTARY PERISTALTIC PUMP

Charles H. Hackman, 195 Holden St., North Fitzroy Vic. 3068, Australia

PCT No. PCT/AU82/00195, § 371 Date Jul. 25, 1983, § 102(e) Date Jul. 25, 1983, PCT Pub. No. WO83/01984, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 23, 1982, Ser. No. 522,160
Claims priority, application Australia, Nov. 25, 1981, 01688/81
Int. Cl.³ F04R *43/12*
U.S. Cl. 417—477 20 Claims



1. A rotary peristaltic pump adapted to be fitted with motor drive means and pump tubing for connection to a source of fluid, said pump comprising:

a rotor member adapted for operative coupling to the motor drive means and having a circular head section housing a plurality of pump tubing-compressing idler rollers in approximately equidistant radially disposed positions for idle rotation axially parallel to the axis of rotation of the rotor member in the course of rotation of said rotor member, said circular head section having an inner flange member and an outer flange member joined in spaced-apart relationship by an axial cylindrical mid-section so as to form a circumferential recess defining a race compartment of the pump tubing-compressing idler rollers, said pump tubing-compressing idler rollers positioned between said inner flange member and outer flange member for idle rotation axially parallel to the axis of rotation of the rotor member by the opposite ends of each said pump tubing-compressing idler roller engaging in recess bearings in the inner flange member and outer flange member respectively, and a minor portion of the circumferential face of each said pump tubing-compressing idler roller disposed in an axially parallel idler roller thrust-bearing groove in the circumferential face of said axial cylindrical mid-section, with the major portion of the circumferential face of each pump tubing-compressing idler roller protruding into said race compartment; and

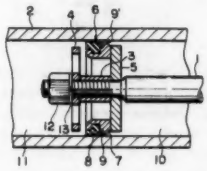
a stator member having a base section and a wall section with inner faces which define an axial opening for accommodating the circular head section of the rotor member and having pump tubing entry and exit ports in the wall section for tangential communication with said race compartment of the rotor member;

said pump tubing being fitted to the pump by loading into the race compartment via said pump tubing entry port, then passing around the race compartment to exit therefrom via said pump tubing exit port, whereby the portion of the pump tubing in said race compartment is successively contacted by the protruding circumferential faces of the pump tubing-compressing idler rollers in the course of rotation of said rotor member so as to be compressed between said inner face of the stator member wall section and said circumferential faces of the pump tubing-compressing idler rollers for effective peristaltic pumping of fluid in said pump tubing, and the circumferential faces of the pump tubing-compressing idler rollers engaging the axially parallel roller thrust-bearing grooves in the circumferential face of the axial cylindrical mid-section so as to minimize axial flexural deformation of each pump tubing-compressing idler roller induced by compression of the pump tubing.

4,518,328
PISTON FOR PISTON PUMP

Kiyoshi Nemoto, Chiba, Japan, assignor to Kabushiki Kaisha Murayama Seisakusho, Tokyo, Japan

Continuation of Ser. No. 173,705, Jul. 30, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 508,539
Claims priority, application Japan, Mar. 14, 1980, 55-32496[U]
Int. Cl.³ F04B *7/00, 21/04*
U.S. Cl. 417—511 1 Claim



1. A piston assembly for a piston pump comprising cylinder means, piston rod means reciprocally movable within said cylinder means, piston means dividing the interior of said cylinder means into a fluid inlet and a fluid discharge side and having fluid flow passage means defined therethrough, a stopper member affixed to said piston rod means on the fluid discharge side of said piston means and structured to engage said piston means without impeding fluid flow through said fluid flow passage means, flange means affixed to said piston rod means on the fluid inlet side of said piston means structured to block fluid flow through said fluid flow passage means upon engagement with said piston means, said piston means being movably mounted relative to said piston rod means for movement between said stopper member and said flange means, said piston means being brought into engagement with said stopper member upon movement of said piston rod means toward said fluid inlet side and into engagement with said flange means upon movement of said piston rod means toward said fluid discharge side, said piston means operating in cooperation with said flange means to pump fluid through said cylinder means when said piston rod means is moved toward said fluid discharge side, said piston means comprising a piston member, a packing fixedly fitted on the outer periphery of said piston member in fluid-tight sliding engagement with the interior of said cylinder means, and a reinforcing ring member fitted between said packing and said piston member on the fluid inlet side of said packing, and orifice means extending through said piston means for placing the interior of said packing in flow communication with said fluid discharge side during pumping operation of said piston means to apply fluid pressure thereto urging said packing against the interior of said cylinder means, said reinforcing ring member being divergent toward the fluid inlet side of said piston means thereby presenting a divergent inner periphery.

4,518,329
WEAR RESISTANT PUMP VALVE

Joe T. Weaver, 2409 Fannin, Midland, Tex. 79705

Filed Mar. 30, 1984, Ser. No. 595,553
Int. Cl.³ F04B *21/00, 21/06;* F16K *15/14, 17/04*
U.S. Cl. 417—566 7 Claims

1. A fluid pressure energized pump valve, comprising:

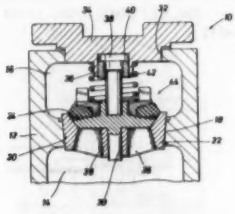
(a) a valve body;

(b) a seal retainer element being threadedly secured to said

valve body and cooperating therewith to define a circular sel receptacle;

(c) a circular elastomeric sealing element being retained within said seal receptacle by said retainer element and forming a frusto-conical sealing surface adapted to engage a frusto-conical valve seat of corresponding configuration; and

(d) an anti-extrusion member formed of non-metal material of greater hardness than the elastomeric material of said sealing element and being secured in assembly with said sealing element, said anti-extrusion member defining a frusto-conical sealing surface coextensive with said frusto-



conical sealing surface of said sealing element for sealing engagement with said frusto-conical valve seat, said anti-extrusion member being located at the downstream portion of said circular elastomeric sealing element and forming a circular yieldable marginal lip at the intersection thereof with said frusto-conical sealing surface of said circular elastomeric sealing element, said circular yieldable marginal lip of said anti-extrusion member yielding radially outwardly responsive to pressure and establishing sealing engagement with said frusto-conical valve seat, providing structural support for said elastomeric sealing element and minimizing extrusion of said elastomeric sealing element.

4,518,330

ROTARY COMPRESSOR WITH HEAT EXCHANGER

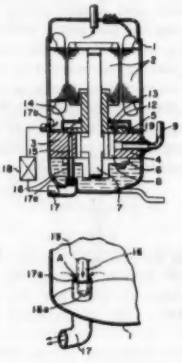
Kazutomo Asami; Fumio Wada; Koji Ishijima, and Yutaka Sato, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,760

Claims priority, application Japan, Aug. 30, 1982, 57-150319; Sep. 30, 1982, 57-148473[U]; Sep. 30, 1982, 57-148474[U]; Oct. 19, 1982, 57-157697[U]; Nov. 19, 1982, 57-175278[U]

Int. Cl.³ F04C *18/00, 29/04;* **F04B** *23/04*

U.S. Cl. 418—63 **3 Claims**



1. A rotary compressor comprising:

a sealed container defining a plenum;

a crankshaft rotatable in said sealed container about a rotary axis;

a main rotary bearing and an end rotary bearing for said crankshaft;

compression means including an eccentric piston rotated by said crankshaft, said compression means and said bearing together defining a portion of a compression chamber including high and low pressure chamber portions;

means for positioning said container so as to define a plenum bottom;

an oil sump in said plenum bottom, said sump including oil for lubricating at least one of said bearings;

means for introducing gas to be compressed into said low pressure chamber portion;

an oil feeding tube extending outside of said container and having one end in fluid communication with said plenum at a position above said sump and a second end inserted in said plenum bottom and in fluid communication with said oil in said sump;

a heat exchanger positioned in line in said oil feeding tube and outside of said container for cooling fluid passing therethrough; and

a compressed gas discharge conduit having one end in fluid communication with said high pressure chamber portion and a second end inserted in said second end of said oil feeding tube with a gap defined between said compressed gas discharge conduit second end and said oil feeding tube second end, whereby oil enters said oil feeding tube through said gap and is induced by compressed gas from said compressed gas discharge conduit to flow through said oil feeding tube to be cooled and return to said plenum.

4,518,331

PRESSURE LOADED GEAR PUMP

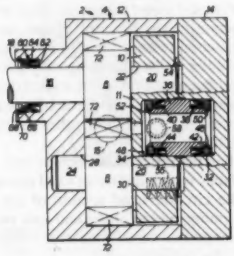
Robert S. Wood, Gosport, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Nov. 22, 1983, Ser. No. 554,235

Claims priority, application United Kingdom, Nov. 25, 1982, 8233611

Int. Cl.³ F04C *2/18, 15/00*

U.S. Cl. 418—132 **8 Claims**

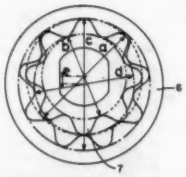


1. A pressure loaded gear pump comprising a housing defining a cavity therein, a pair of intermeshing gears positioned in the cavity, at least one gear side face sealing member positioned in the cavity between the gears and the housing, and pressure loading means, for defining a pressure loaded area in the use of the pump, including a bobbin having first and second axial seals mounted thereon, wherein the bobbin is positioned within the housing such that the first seal is located in a bore defined in the housing and the second seal is located in a bore having substantially three quarters of its circumference defined by the gear face sealing member and substantially one quarter of its circumference defined by the housing.

4,518,332
OIL PUMP

Yasuyoshi Saegusa, Hyogo, Japan, assignor to Sumimoto Electric Industries, Ltd., Osaka, Japan

Filed Oct. 22, 1982, Ser. No. 436,024
Claims priority, application Japan, Oct. 22, 1981, 56-169732
Int. Cl.³ F04C 2/10
U.S. Cl. 418—150 1 Claim



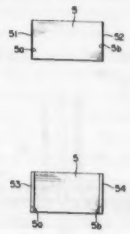
1. An oil pump, comprising:
an internal combustion engine;
a drive shaft, driven by said engine; and
an inner rotor and an outer rotor surrounding said inner rotor, mounted on said drive shaft;
said inner rotor having at least eight inner rotor teeth, said outer rotor having a number of outer rotor teeth differing from the number of inner rotor teeth by one, said inner rotor having an inner rotor tooth profile formed from a trochoidal curve defined by a base circle of diameter A, a rolling circle of diameter B and an eccentricity e equal to between 0.4 and 0.5 of the rolling circle diameter B, and a track circle diameter C which is between 0.5 and 3.0 times said rolling circle diameter B;
said inner rotor being rotatable in said outer rotor in tooth meshing relation with an eccentricity equal to said eccentricity e;
said inner rotor tooth profile being bounded radially outwardly by a circle of diameter a and radially inwardly by a circle of diameter b, wherein $a=A+B-C+2e$ and $b=A+B-C-2e$;
said outer rotor having an inner surface for engaging the outer surface of said inner rotor as the inner rotor rotates eccentrically therein said inner surface having a plurality of equally spaced inwardly circularly arched portions centered at equally spaced locations on a circle of radius $R=(A+B)/2+\Delta R$ wherein $0<\Delta R\leqq 0.08$ mm, each of said plurality of circularly arched portions having radius $r=(C/2)-\Delta r$, wherein $0<\Delta r\leqq 0.08$ mm.

4,518,333
ROTARY BLADE PUMP HAVING BLADES WITH WEAR RESISTANT END SURFACES

Kimiaki Seki, Kasai, and Akio Matsumoto, Kanzaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,407
Claims priority, application Japan, Feb. 21, 1983, 58-28743
Int. Cl.³ F04C 2/00, 15/00
U.S. Cl. 418—152 3 Claims

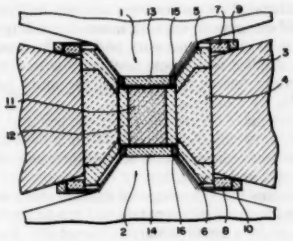
1. In a rotary pump means having a cylindrical housing having axial inner end surfaces and a cylindrical inner peripheral surface between said end surfaces, formed with air suction and discharge ports, a rotary shaft rotatably mounted within said housing such that the center line of said shaft is disposed eccentrically with respect to the center line of said cylindrical inner peripheral surface of said housing, a bracket rotatably supporting said rotary shaft in association with said housing, a rotor having radial slots therein, concentrically secured to said rotary shaft and eccentrically positioned with respect to said center line of said cylindrical inner peripheral surface of said housing, and a number of blades each radially shiftably received in respective ones of said radial slots formed in said rotor such that during pump operation the radially outward peripheral surfaces and radially extending axial end surfaces of said blades are always in respective contact with said end surfaces and said cylindrical inner peripheral surface of said housing and adapted to suck the air through said air suction port to discharge the air through said discharge port, the improvement wherein said blades are integrally formed of a solid lubricating material exposed on the side surfaces thereof and said radially outward peripheral surfaces thereof, only the axial ends, including said end surfaces, of said blades being coated with layers of synthetic resin having excellent resistance to heat and wear and a low coefficient of friction.



4,518,334
HIGH TEMPERATURE HIGH PRESSURE APPARATUS

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,362
Int. Cl.³ B30B 11/32
U.S. Cl. 425—77 6 Claims



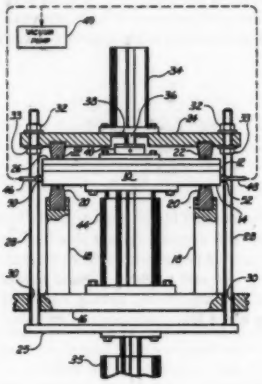
1. A high temperature high pressure apparatus which comprises: an annular die having a straight cylindrical bore and a substantially conical face in adjacency outwards with each end thereof, a pair of tapered punches which are in opposed and axial alignment with the die so that a conical face of each punch is substantially in parallel with that of the die, a pair of inner gaskets, each of which is made of fired refractory and is arranged in direct abutment on the conical face of the punch and the bore of the die, a pair of outer gaskets, which are made of material of intermediate hardness level and is arranged in adjacency outside the inner gasket, and a pair of stopper rings of readily deformable but highly tough material and arranged in adjacency outwards to the outer gaskets.

4,518,335

DILATANT MOLD AND DILATANT MOLDING APPARATUS

Vimal K. Pujari, Columbia, Md., assignor to Allied Corporation, New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,906
Int. Cl.[3] B29C *1/00, 1/16;* B29D *31/02*
U.S. Cl. 425—78 **22 Claims**



1. A molding apparatus for forming a powder preform having the shape of a desired part comprising a mold having a fill aperture, an internal mold cavity corresponding to the shape of the part to be formed connected to said fill aperture, and at least one exhaust port connected to said mold cavity, a pedestal for resiliently supporting said mold, vibrator means for vibrating said mold, powder feed means for transmitting powdered material to said mold cavity through said fill aperture, and means attached to said at least one exhaust port for evacuating the air from said mold cavity, the improvement characterized by:

a dilatant molding having a top half and a mating bottom half, a fill aperture, an internal mold cavity connected to said fill aperture formed between said top half and bottom half, at least one exhaust port adjacent to said mold cavity, an annular seal recess between said top half and said bottom half circumscribing said internal molding cavity and said at least one exhaust port, and a resilient seal disposed in said annular seal recess resiliently separating said top and bottom halves of the mold; the mold halves being separable by vibration

compressive mean cooperating with the pedestal for producing a force urging the top and bottom halves of said dilatant mold into physical contact compressing said resilient seal in said seal recess; and

vibrator means for vibrating said dilatant mold with a force sufficient to cyclically separate said top and bottom halves of the mold a small distance against the force of said compressive means dilating the volume of said internal mold cavity.

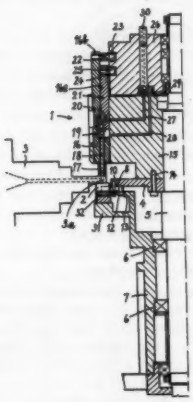
4,518,336

APPARATUS FOR FORMING PLASTIC MATERIAL GASKETS IN STOPPERS COMPRISING A CUP, SUCH AS SCREW-ON AND CROWN CAPS

Rodiero Alieri, Imola, Italy, assignor to SACMI Cooperativa Meccanici Imola Soc. Coop. a Resp. Lim., Imola, Italy

Filed Mar. 23, 1984, Ser. No. 593,069
Claims priority, application Italy, Oct. 7, 1982, 3555 A/82
Int. Cl.[3] B29C *5/00;* B29D *31/00*
U.S. Cl. 425—110 **5 Claims**

1. An apparatus for forming plastic material gaskets in stoppers comprising a cup, such as screw-on caps, crown caps, and the like, characterized in that it comprises a carousel which carries a plurality of peripherally distributed cups, a means for picking up and metering amounts of a plastic material which are supported slidably on said carousel, respectively in line with said cups, and forming a spoon member facing in the direction of rotation of said carousel, said picking up and metering means being adapted to be selectively communicated to suction and blowing pneumatic means, an extruder nozzle for said plastic material which is stationary relatively to said



carousel and opens at said pick-up and metering means, there being further provided a means of sequentially driving said pick-up and metering means between a raised position whereat a metered amount of material is picked up by said spoon member and the pick-up and metering means are connected to the suction means to retain the metered amount, and a lowered position whereat said metered amount of plastic material is introduced into said metal cup and the pick-up and metering means are connected to the blowing means to eject the metered amount out of the cup.

4,518,337

HYDRAULIC PRESS

Murray C. Tribbett, Piqua, Ohio, assignor to The French Oil Mill Machinery Co., Piqua, Ohio

Filed Aug. 31, 1983, Ser. No. 528,346
Int. Cl.[3] B29F *1/00;* B30B *11/02*
U.S. Cl. 425—167 **8 Claims**

1. In a hydraulic press of the type having a base, means mounted on said base for generating hydraulic pressure, a source of hydraulic fluid mounted on said base and communicating with said pressure generating means, an upper hot plate adapted to support a mold half, fluid actuated means for conveying liquid material to said upper hot plate, a platen mounted for vertical reciprocating movement relative to said upper hot plate and including a lower hot plate adapted to support a mold half, hydraulically actuated means for lifting said lower hot plate toward said upper hot plate and hydraulically actuated means for urging said lower hot plate upwardly, thereby clamping together mold halves supported on said hot plates, the improvement comprising:

a first side plate mounted on said base;

a second side plate mounted on said base, said second side plate having channel means formed in an interior thereof for conveying hydraulic fluid therethrough;

means joining said first and second side plates to form a rigid structure for supporting said upper and lower hot plates and said liquid conveying means;

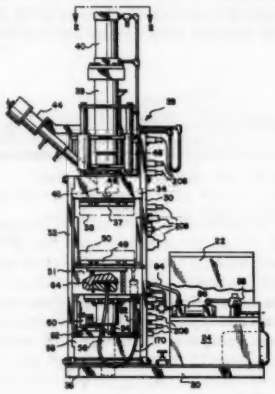
conduit means communicating with said channel means and extending from said second side plate to said liquid material

conveying means, said lower hot plate lifting means, and said urging means;

supply conduit means extending from said pressure generating means to said channel means;

return conduit means extending from said channel means to said source of hydraulic fluid;

valve means mounted on said second side plate and communicating with said channel means for selectively directing fluid from said channel means to said liquid material conveying



means, said lower hot plate lifting means, and said urging means; and

control means for actuating said valve means in a predetermined sequence to direct fluid from said supply conduit means, through said channel means and said conduit means, to selected ones of said liquid material conveying means, said lower hot plate lifting means, and said urging means, and from said selected ones through said conduit means, said channel means and said return conduit means to said source.

4,518,338

INJECTION MOLDING MACHINE WITH MOLD CHANGING AND MOLD PRECONDITIONING DEVICE

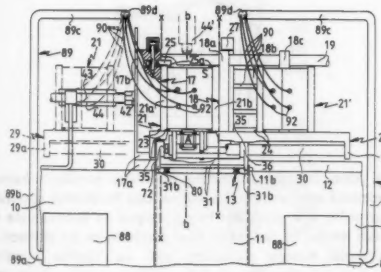
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg l, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 506,026

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222828

Int. Cl.³ B29C *1/00*; B29F *1/00*

U.S. Cl. 425—183 **23 Claims**



1. In an injection molding machine which includes a plurality of interchangeable injection molding dies and is equipped with die temperature conditioning means, including means for circulating conditioning fluid and for controlling the temperature of the conditioning fluid, which machine further includes a machine base carrying a horizontally oriented die closing unit with a stationary die carrier member, a movable die carrier member, and a drive assembly producing horizontal die opening and die closing movements along the longitudinal center axis of the die closing unit, and wherein the stationary and movable die carrier members have parallel vertical die mounting faces and include means for releasably clamping to said die mounting faces the two halves of a succession of said injection molding dies which, for this purpose, have standardized oversize back plates which are engageable by said clamping means; in such a machine, a device for mechanically exchanging injection molding die assemblies in the die closing unit and for preconditioning a die assembly in an assigned waiting position, prior to insertion into said die-closing unit, while another die assembly remains in service, in its normal operating position between the die carrier members, the device comprising in combination:

a translation table arranged alongside the die closing unit, the translation table defining two die emplacements equidistant from the center axis of the die closing unit, for the support of two die assemblies in waiting position at the same level at which a die assembly is held in its operating position, the translation table being movable horizontally, so that either of the two die emplacements can be brought to coincide with a transfer position in transverse horizontal alignment with the operating position of the die assembly;

a translation drive connected to the translation table for the creation of translational movements of the translation table;

means defined by each of the two die emplacements on the translation table for guiding a die assembly for horizontal transfer movements at right angles to the center axis;

means defined by the stationary and movable die carrier members for supporting a die assembly in its operating position between said die carrier members, when not attached to the mounting faces of said members, and for guiding said die assembly for horizontal transfer movements at right angles to the center axis;

a transfer drive engageable with a die assembly in said die emplacement coincident with the transfer position, so as to entrain said die assembly in a transfer movement between the transfer position and the operating position;

two separate sets of conditioning fluid lines associated with the two die emplacements on the translation table, each set of conditioning fluid supply lines being adapted to connect a die assembly in waiting position to said temperature conditioning means; and wherein

each die emplacement has its guide means so arranged that, in the transfer position, said die emplacement cooperates with the support and guide means of the two die carrier members to define a substantially continuous straight-line transfer path for the die assembly between the transfer position and the operating position;

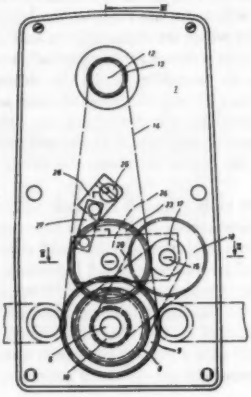
the lines of each set of supply lines have flexible length portions terminating in line couplings by which said lines are releasably connectable to a die assembly; and

the flexible length portions of each set of supply lines begin at a point in space which is so positioned in relation to the operating position and the waiting position defined by the associated die emplacement that the lines of each set of supply lines, when connected to a die assembly, accommodate the movements of said die assembly between its waiting position and the operating position, remaining connected for fluid circulation in both positions and during movement therebetween.

4,518,339
DOUGH-ROLLING MACHINE

Eugen Morgenthaler, Kirchberg, Switzerland, assignor to Seewer AG, Canton of Berne, Switzerland

Filed May 1, 1980, Ser. No. 145,437
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922702
Int. Cl.³ A21C 3/02
U.S. Cl. 425—367 4 Claims



1. A dough-rolling machine of the type having a frame, a stationary shaft on which a first roller is mounted, a displaceable shaft on which a second roller is mounted, and a drive motor having a drive shaft, wherein the improvement comprises:

a countershaft secured to said frame, said displaceable shaft being adapted for translatory rotation about the axis of said countershaft,

a first transmission wheel fixed on said drive shaft,

a second transmission wheel fixed on said stationary shaft,

a drive gear fixed on said displaceable shaft,

a compound transmission gear mounted loose on said stationary shaft between said second transmission wheel and said first roller and including a third transmission wheel, situated nearest said first roller and drivingly connected to said first transmission wheel, and a fourth transmission wheel situated remote from said first roller, and

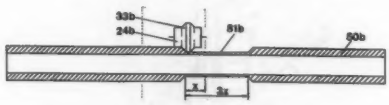
a further compound transmission gear mounted loose on said countershaft and including a pinion meshing with said drive gear, a fifth transmission wheel drivingly connected to said second transmission wheel, and a sixth transmission wheel situated between said pinion and said fifth transmission wheel and drivenly connected to said fourth transmission wheel.

4,518,340
APPARATUS FOR THE MANUFACTURE OF A BLANK FOR A CONTAINER

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Loddeköpinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 154,887, May 30, 1980, Pat. No. 4,378,878. This application Dec. 23, 1982, Ser. No. 452,771
Claims priority, application Sweden, Jun. 11, 1979, 7905045
Int. Cl.³ B29C 17/02, 17/07
U.S. Cl. 425—393 11 Claims

1. Apparatus for producing a tubular pre-molding of a thermoplastic material from a tubular blank in which the premolding comprises a mouth part with adjacent neck section at one end, and a tubular section continuing from said neck section, said tubular section of the blank consisting mainly of orientable material, said apparatus comprising means for increasing the glass transition temperature Tg in said mouth part and neck section including means for reducing the thickness of the mouth part and adjacent neck section of said blank to orient the material by the reduction of the thickness of the material, said thickness reducing means comprising forming means for applying radial pressure to said blank, in a restricted axial region of the portion of the blank which is to form the mouth part and adjacent neck section, to initiate said reduction of thickness thereof and means for providing relative displacement between said forming means and said blank axially of said blank to extend the region of reduction of thickness of the blank in said mouth part and adjacent neck section, means for maintaining

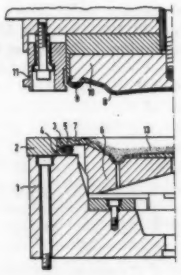


the remainder of the blank with its original thickness to complete the form of said pre-molding, such that at least in the mouth part, said material has a lower degree of orientation in the circumferential direction of the pre-molding as compared to the axial direction, and means for controlling the orientation of the mouth part and adjacent neck section of the pre-molding by the thickness reduction to provide said increased glass transition temperature Tg in said mouth part and neck section such that it is substantially equal to the glass transition temperature of said tubular section when orientable material of said tubular section is oriented by a subsequent blowing of the pre-molding to a container.

4,518,341
PRESS FOR MANUFACTURING PLATES, ETC.

Hilmar Suffa, Kochel am See, Fed. Rep. of Germany, assignor to Dorst Maschinen-und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel & Co., Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,528
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311685; Sep. 7, 1983, 3332277
Int. Cl.³ B30B 5/02; B28B 3/00
U.S. Cl. 425—405 H 9 Claims



1. A press for manufacturing plate-like products having a countermold and a press die which can be closed against the countermold, this press die being shaped in accordance with the inner shape of the plate-like product to be pressed, the countermold having a cavity and an elastic membrane mounted at its edge for closing off the cavity which cavity corresponds to the dimensions of the finished plate, the membrane also having a shape corresponding to the base of the plate and being adapted to have porcelain in power form distributed thereover when the press die is separated from the countermold, the press die having a flexible coating, the mem-

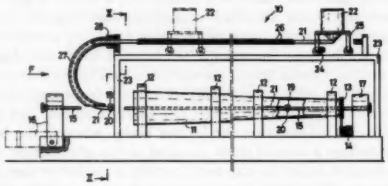
brane and the coating forming a plate shaping mold chamber therebetween, the coating being provided at its edge with a hollow torus bulging towards the membrane; the membrane having an annular groove aligned with and facing the torus for receiving the torus when the die press is closed against the countermold, means for pressurizing the cavity and forcing the membrane toward the die press to eliminate the groove, collapse the bulge and cause inward migration of the material of both the membrane and the coating to form a rounded upper portion of the edge of the product and locate at the lower portion of the edge of the product the wedge-shaped pinch-off of the mold cavity formed by the juncture of the coating and membrane.

4,518,342

APPARATUS FOR FORMING CENTRIFUGED POLES

Virgilio Branca, Milan, Italy, assignor to Somiver s.r.l., Milan, Italy

Filed Apr. 10, 1984, Ser. No. 598,588
Claims priority, application Italy, Apr. 11, 1983, 20528 A/83
Int. Cl.³ B29C *5/00*; B29D *3/00*
U.S. Cl. 425—435 **8 Claims**



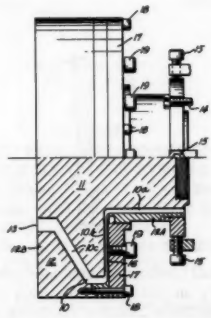
1. An apparatus for forming poles made of high-strength resin, in which, in a rotary mould, the resin is spread over a support made of felt or the like, provision being made for heating means in proximity to the mould, characterized by the fact that in the interior of said mould there are guide means for guiding a resin-delivery head which is movable to and fro and connected by a hose to a resin feed apparatus positioned outside the mould.

4,518,343

EXTRUSION DIE

Edward J. Seiffert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1983, Ser. No. 472,643
Int. Cl.³ B29F *3/04*
U.S. Cl. 425—466 **4 Claims**



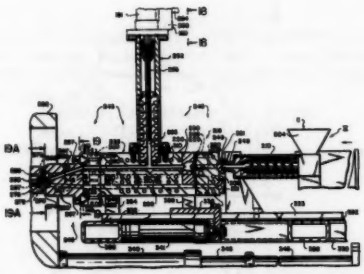
1. In a die for the extrusion of molten polymeric material in a tubular configuration having a tubular channel therein for polymer flow extending from a polymer feed end of the die to a die orifice and having a first, inlet section extending substantially parallel to the direction of extrusion, a second section extending from the end of the first section substantially radially with respect to the direction of extrusion and at substantially a right angle to the inlet section, and a third, outlet section extending from the end of the second, radial section to the die orifice, the improvement wherein the second, radial section is defined by opposing surfaces, at least a portion of one opposing surface being deformable by an adjustment force applied to the deformable portion externally and deforming means associated with the deformable portion of the surface.

4,518,344

METHODS AND APPARATUS FOR MAINTAINING A PRESSURE CONTACT SEAL BETWEEN NOZZLES AND CAVITIES OF AN ON-LINE INJECTION MOLDING MACHINE

Maurice G. Latreille, Batavia, and William A. Tennant, Schaumburg, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 13, 1983, Ser. No. 484,706
Int. Cl.³ B29C *1/00*; B29F *1/023*; B29D *9/00*
U.S. Cl. 425—570 **47 Claims**



1. A multi-coinjection nozzle injection molding apparatus for an injection molding machine, which comprises,

runner means having channels for a plurality of polymeric material streams, and having a forward end with a plurality of co-injection nozzles mounted therein each having means for receiving the plurality of streams and for substantially simultaneously co-injecting a plurality of polymeric materials therefrom,

support means for supporting the runner means,

mounting means for mounting the runner means on the support means, and adapted to allow the runner means to float axially on the center line of the apparatus while the machine is in operation.

4,518,345

DIRECT IGNITION GAS BURNER CONTROL SYSTEM

Carl J. Mueller, St. Louis County, and John S. Haefner, Jefferson County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 28, 1983, Ser. No. 470,309
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—24 **11 Claims**

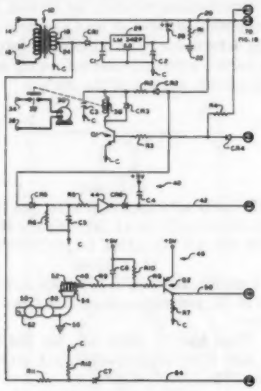
6. In a gas burner control system,

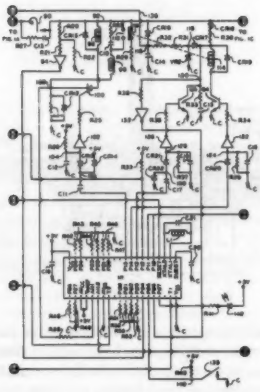
a burner;

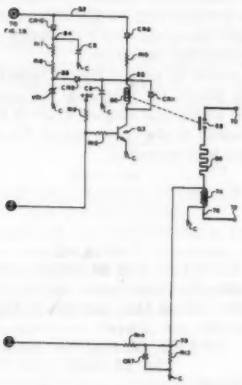
two electrically operated valves connected fluidically in series with said burner,

each of said valves having a controlling electrical winding;

an electrical resistance igniter for igniting said burner;
means for effecting energizing of said igniter;
means for monitoring the level of energizing of said igniter and for varying an igniter warm-up time period in response to said monitoring; and







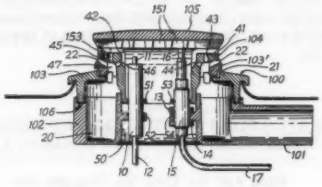
means for effecting sequential opening of said valves and for effecting a reverse order of said sequential opening on alternate burner cycles so as to determine if none, one, or both of said electrical windings are open, shorted, or energized.

4,518,346

GAS FUEL BURNER WITH INCORPORATED IGNITION AND SAFETY DEVICES

Jacques F. Pistien, L'ile-st-Denis, France, assignor to Gaz de France, Paris, France

Filed Apr. 19, 1984, Ser. No. 601,933
Claims priority, application France, Apr. 29, 1983, 83 07170
Int. Cl.³ F23Q *3/00*
U.S. Cl. 431—266 **11 Claims**



1. A burner for gas fuel with incorporated ignition and safety systems, of the type having a main flame and a pilot flame to stabilize said main flame, and comprising a burner body which defines an annular distribution chamber receiving the primary air-gas fuel mixture, main paths being provided in said burner to supply the main flame with fuel mixture from said chamber, and auxiliary paths being likewise provided in the burner body to supply the pilot flame with fuel mixture from said chamber, at least one igniting electrode, one safety element, and a protective cap mounted on the burner body, wherein the burner body defines a central shaft, co-axial to the distribution chamber, situated under the cap and opening at the lower part of the burner to allow admission of secondary air, radial grooves opening at least locally in the distribution chamber are formed in the upper part of the burner body situated under the cap, the ignition electrode and safety element being placed inside the central shaft under the protective cap, and orifices being formed through the central shaft and communicating with the distribution chamber for directing gas jets towards said ignition electrode and said safety element.

4,518,347

LIQUID FUEL COMBUSTION APPARATUS

Kazunori Sonetaka, Hirakata; Atsushi Nishino, Neyagawa, and Tadashi Suzuki, Katano, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Continuation of Ser. No. 188,271, Sep. 18, 1980, abandoned. This application Oct. 18, 1983, Ser. No. 542,896
Claims priority, application Japan, Sep. 19, 1979, 54-121134
Int. Cl.³ F23D *3/18*
U.S. Cl. 431—325 **25 Claims**

1. A liquid fuel combustion apparatus comprising a fuel tank, a wick partially immersed in fuel within the tank, and means defining a combustion chamber enclosing an upper section of the wick, said wick having two sections, the upper section being a burning section made of a glass fiber material which has been dealkalized so that said upper section contains at least 80% or more of silica, alumina or a mixture thereof, there being present 70% to 90% silica in said upper section, said

lower section being a suck up portion having a good fuel suck-up ability whereby the fuel sucked up from the suck-up portion is vaporized at the burning section and burned in the combustion chamber.

4,518,348

FUEL FIRED BURNER ASSEMBLY

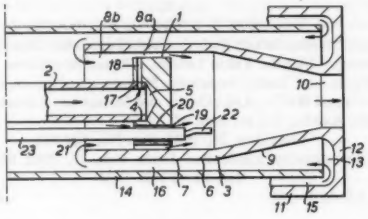
Philip J. Wedge, and Robert C. Bridson, both of Solihull, England, assignors to British Gas Corporation, London, England

Filed Sep. 27, 1983, Ser. No. 536,308

Claims priority, application United Kingdom, Sep. 29, 1982, 8227847

Int. Cl.³ F23Q *3/00*

U.S. Cl. 431—265 **8 Claims**



1. A fuel-fired burner assembly including a fuel nozzle, a fuel supply conduit connected to and terminating in the nozzle, means for supplying fuel to the conduit, a combustion chamber into which the nozzle extends, the nozzle comprising a nozzle body extending radially outwardly from the conduit in spaced relation to the inner wall of the combustion chamber so as to form a clearance therebetween and including means for spraying fuel supplied by said fuel supplying means directly into the clearance between the nozzle body and the chamber,

means for supplying air towards the nozzle body in the direction of the chamber so that the fuel issuing from the nozzle and the air mix in the clearance before entering the combustion chamber,

the nozzle body having an aperture connecting the air supplying means to the chamber independently of the clearance, and

a pilot burner for providing a flame within the chamber for igniting the fuel and air mixture entering the chamber from the clearance.

4,518,349

CANTILEVERED BOAT-FREE SEMICONDUCTOR WAFER HANDLING SYSTEM

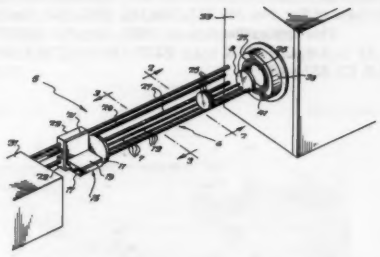
Richard E. Tressler, Julian; Joseph Stach, and Roger L. Baeten, both of State College, all of Pa., assignors to Better Semiconductor Processes (BSP), State College, Pa.

Filed Dec. 1, 1983, Ser. No. 557,232

Int. Cl.³ F27D *3/00, 5/00;* F27B *9/04, 9/14*

U.S. Cl. 432—11 **24 Claims**

1. In a process of heat treating semiconductor wafers in a high temperature furnace equipped with an internal heat treating chamber and carrier means adapted to support said wafers and traverse the heat treating chamber, the improvement comprising reducing the level of undesired contaminating particles generated during the process by mounting the wafers onto a boat-free wafer carrier, said carrier comprising a plurality of semi-circular spaced cantilevered rods or tubes having a multiplicity of spaced slots for cooperatively holding individual wafers in a vertical position.



4,518,350

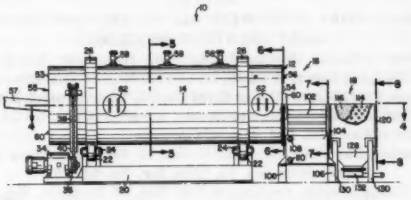
APPARATUS AND METHOD FOR CALCINING SAND

Edward E. Mueller, Tonka Bay, and Paul L. Jensen, Minneapolis, both of Minn., assignors to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Filed Mar. 29, 1984, Ser. No. 594,557

Int. Cl.³ F27B *14/00, 9/14;* F27D *1/16*

U.S. Cl. 432—13 **20 Claims**



8. Apparatus for calcining sand, which comprises:

an elongate, refractory-lined drum having a longitudinal axis, a generally cylindrical side, and opposite generally circular closed ends;

means defining a material inlet in one end of said drums;

means defining a material outlet in the other end of said drum;

means for supporting said drum for at least partial rotation about its longitudinal axis;

means for effecting oscillation of said drum over a predetermined arc about its longitudinal axis;

a plurality of burners located at longitudinally spaced intervals in the side of said drum;

means defining an exhaust flue in the said other end of said drum; indexing structure located inside said drum opposite said burners for mixing the sand for maximum exposure to said burners to effect calcination, and for advancing the sand from the inlet to the outlet responsive to oscillation of said drum;

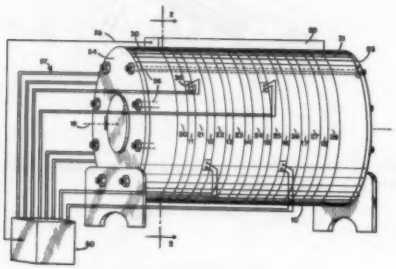
means for receiving and precooling the calcined sand discharged from the outlet of said drum; and

means for receiving the calcined, precooled sand and for classifying it into sand of a predetermined granular size for further use.

4,518,351
METHOD OF PROVIDING A DYNAMIC TEMPERATURE GRADIENT

Robert H. Mellen, Sr., P.O. Box 535, New London, N.H. 03257

Division of Ser. No. 360,327, Mar. 22, 1982, Pat. No. 4,423,516.
This application Sep. 22, 1983, Ser. No. 534,707
Int. Cl.[3] F26B *9/12*; F27D *13/00*; F27B *5/00*
U.S. Cl. 432—18 5 Claims



1. A method of providing a dynamic temperature gradient in an enclosed space comprising:

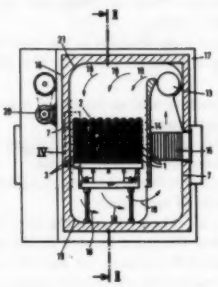
(a) producing a net heat input radially inward at all points around an axis of enclosed space; and,

(b) controlling said net heat input in a plurality of individually controlled discrete planar layers arranged normal to said axis, whereby temperature gradients may be formed along said axis with all heat flow forming said gradients flowing axially.

4,518,352
INDUSTRIAL OVEN WITH AIR RECIRCULATION FOR HEAT TREATING PROCESSES

Horst Gillhaus, Dortmund-Loh; Fritz Hegewaldt, Herdecke; Wolfgang Faber, Waltrop, all of Fed. Rep. of Germany; Jürgen Baer, Mägenwil, and Ernst Toplak, Oberrohrdorf, both of Switzerland, assignors to Brown, Boveri & Cie. AG., Mannheim-Kaefertal, Fed. Rep. of Germany

Continuation of Ser. No. 418,552, Sep. 15, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,151
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136667
Int. Cl.[3] F27D *7/04*; F27B *9/04*; F26B *19/00*
U.S. Cl. 432—199 10 Claims



1. Industrial oven for heat treatment of a charge having individual components to be treated, comprising:

walls, at least a portion of said walls defining a treatment chamber for receiving the charge;

means for causing air to flow through said chamber in a given air flow direction substantially parallel to at least some of said walls;

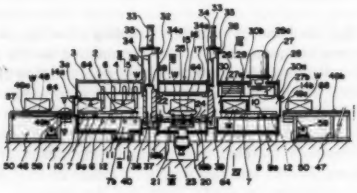
means for supporting the charge in said treatment chamber, said supporting means maintaining the charge at a distance from said at least some walls defining a space therebetween, and said supporting means maintaining a mutual spacing between the individual components of the charge permitting said air flow causing means to provide a substantially uniformly distributed given air flow velocity in said given air flow direction between the individual components of the charge; and

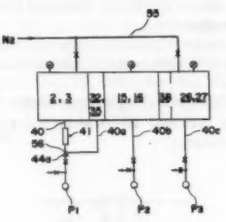
means in the form of air flow resistance obstacles extended substantially perpendicular to said given air flow direction in said space between the charge and said at least some walls for reducing the velocity of said air flow in said space substantially to said given air flow velocity and for maintaining high temperature uniformity within the charge.

4,518,353
VACUUM SINTERING FURNACE

Takashi Banno, Sakai; Tadashi Seki, Toyonaka; Masafumi Kawaguchi, Niigata; Yukio Tancka, Niigata; Morikatsu Iwasaki, Niigata, and Toshio Nagasawa, Niigata, all of Japan, assignors to Chugai Ro Co., Ltd., Osaka and Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 26, 1984, Ser. No. 624,611
Claims priority, application Japan, Jun. 27, 1983, 58-116688
Int. Cl.[3] F27B *5/04*
U.S. Cl. 432—205 4 Claims





1. A vacuum sintering furnace which comprises:

a first section having a first furnace body in which a workpiece charged thereinto is heated in vacuum so that lubricant contained in said workpiece is vaporized;

a second section having a second furnace body which neighbors with said first furnace body and in which said workpiece charged thereinto from said first furnace body is sintered in vacuum;

a third section having a third furnace body which neighbors with said second furnace body and in which the said workpiece charged thereinto from said second furnace body is cooled;

a first connecting hood means which connects an outlet portion of said first furnace body and an inlet portion of said second furnace body and which is provided with a

first door for selectively opening and closing the outlet portion of said first furnace body and a second door for selectively opening and closing the inlet portion of said second furnace body; and

a second connecting hood means which connects an outlet portion of said second furnace body and an inlet portion of said third furnace body and which is provided with a third door for selectively opening and closing the outlet portion of said second furnace body;

said first furnace body including therein a carrier means for supporting the workpiece thereon and conveying the workpiece into said second furnace body from said first furnace body, and being connected to a vacuum pump by means of a vacuum exhaust line provided with a lubricant trapping device which is to trap the vaporized lubricant contained in an exhaust gas from said first furnace body;

said second furnace body including therein a lift means for receiving and supporting therein the workpiece conveyed from said first furnace body;

said third furnace body including therein a carrier means for conveying the workpiece on said lift means into said third furnace body and supporting said workpiece thereon.

4,518,354

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS WITH ANTISTATIC LAYER CONTAINING NONIONIC SURFACE ACTIVE AGENT

Shigeki Yokoyama; Akira Hibino; Yukio Maekawa, and Hiroshi Kawasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1983, Ser. No. 497,285

Claims priority, application Japan, May 21, 1982, 57-85764

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.³ G03C *1/78*

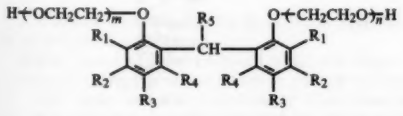
U.S. Cl. 430—527 **8 Claims**

1. A silver halide photographic light-sensitive material comprising:

a support base;

a silver halide emulsion layer; and

an antistatic layer containing a nonionic surface active agent having two polyoxyethylene chains in a molecule represented by the general formula (I):



(I)

wherein R_1 and R_3 each represents a substituted or unsubstituted alkyl group, an aryl group, an alkoxy group, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group or a sulfamoyl group, R_2 and R_4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, an aryl group, an alkoxy group, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group or a sulfamoyl group, R_5 represents a hydrogen atom, a methyl group or an α-furyl group, and m and n independently represents an average degree of polymerization of ethylene oxide, which is 55 to 30, wherein the compound represented by the formula (I) is present in an amount within the range of 20 to 200 mg/m² of the support base.

4,518,355

DENTAL HANDPIECE

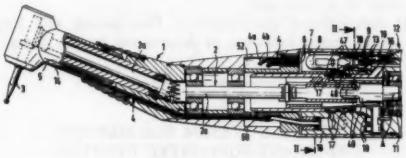
Jürgen Hoffmeister, and Bernhard Kuhn, both of Biberach, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,222

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215219

Int. Cl.³ A61C *1/00*

U.S. Cl. 433—29 **10 Claims**



1. A dental handpiece comprising means provided at one end of the handpiece to mount a dental implement, a drive train arranged within the handpiece and extending to said one end of the handpiece to operate the dental implement when the latter is mounted on the handpiece, a light source consisting of an electrically energizable incandescent lamp arranged within said handpiece, and a light guide extending from the light source to a position adjacent to said one end of the handpiece for directing light to a treatment region adjacent to the dental implement, said light guide being arranged within the handpiece and extending alongside the drive train, an electrical supply to said incandescent lamp which extends within the handpiece from a second end of the handpiece remote from the implement-end thereof, a first contact for said electrical supply being arranged at said second end of the handpiece, and a second contact for engaging said first contact being connected to a source for said electrical supply, including a driving device, couple with said second end of the handpiece and having a drive shaft engaging with said drive train, and a second contact engaging with said first contact, the driving device and the handpiece being relatively rotatable when coupled together, and said first and second contacts being slidably interengageable.

4,518,356

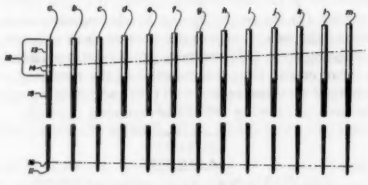
UTRASONIC DENTAL FILE AND METHOD OF DETERMINING FAILURE RESISTANT LENGTHS THEREOF

Russell D. Green, Georgetown, Del., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Sep. 30, 1983, Ser. No. 537,890

Int. Cl.³ A61C *5/02*

U.S. Cl. 433—102 **3 Claims**



1. A method of determining the ideal length of an ultrasonic endodontic file to provide maximum resistance to breakage and including a standard tapered flexible working portion of predetermined length connected to one end of a shank of uniform size and shape of cross-sections from a batch of said files having a range of overall lengths and all of similar diame-

ter 1 mm from the tip end of the working portion, said method comprising the steps of:

(a) individually testing a plurality of said tapered files having a range of lengths of shanks of uniform cross-sectional shapes and sizes within water to simulate conventional endodontic conditions,

(b) observing a predetermined number of said files of different lengths successively for same known periods of time until breakage of files of certain lengths occur,

(c) determining the files of lengths which resist breakage among those in which breakage occurred, within a tolerance of ±1 mm and

(d) standardizing production of files having said length which resists breakage as determined by the foregoing steps.

4,518,357

FASTENING SYSTEM FOR MUCOUS MEMBRANE-SUPPORTED DENTURE

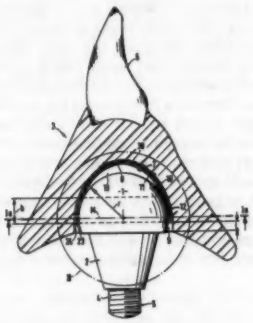
Egon Brinkmann; Mandred Putenat, both of Oldenburg, and Erhard Dörre, Plochingen, all of Fed. Rep. of Germany, assignors to Fedlmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 10, 1982, Ser. No. 440,741

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145260; Oct. 7, 1982, 3227174

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—173 **14 Claims**



1. A fastening system for a removable mucous membrane-supported denture comprising:

(a) two spherically shaped heads (1) fastened on implants or natural teeth, the heads (1) having a highly polished surface and a size exceeding hemispherical;

(b) a mucous membrane-supported denture having two recesses (7) therein having walls (10) in that surface facing the mucous membrane;

(c) two retaining caps (8) having openings (9) therein composed of a smooth elastic plastic material within said recesses (7) for engaging the heads and shaped for contacting the heads only in the area of their equator; and

(d) adapting rings (12) composed of a plastic material which is more elastic than the material of the retaining caps (8) arranged between recess wall (10) and retaining caps (8) in the area of opening (9) of the retaining caps (8).

4,518,358

EDUCATIONAL TOY AND METHOD

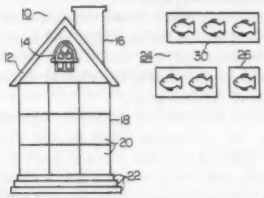
Naomi Mather, 62 Patton Dr., Princeton, N.J. 08540

Filed Aug. 2, 1982, Ser. No. 404,549

Int. Cl.³ G09B *1/04*

U.S. Cl. 434—195 **12 Claims**

1. A teaching aide comprising a plurality of indicia bearing means of unit size and at least one indicia bearing means which is a multiple of unit size together with an organizer having means for allowing, either physically or by representation, the placing of the indicia bearing means in the organizer in a prescribed manner so as to form a distinct set of patterns, each



pattern representing a specific digit or number and wherein said organizer means comprises a unit indicia bearing means size entrance into the organizer and opposite thereto an entrance for indicia bearing means of multiple unit width.

4,518,359

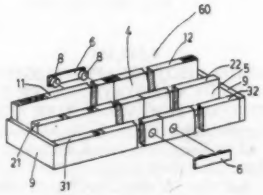
MULTI-PURPOSE INSTRUCTING BLOCK

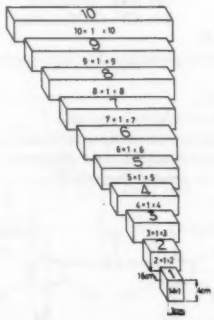
Wang Yao-Psong, No. 16, La. 153, Chien-Te St., Taichung, Taiwan

Filed Dec. 30, 1983, Ser. No. 567,176

Int. Cl.³ G09B *19/02*

U.S. Cl. 434—195 **1 Claim**





1. An educational aid for teaching mathematics, comprising:

(a) M blocks of generally equal height and width divided into N sets each containing L blocks (where M/N is an integer), each of the L blocks in the associated one of said N sets being of equal length to each other, wherein said equal length in each set corresponds to a unit length multiplied by a number (N) representing the associated Nth set, each of the L blocks in the Nth set displaying indicia representing the numeral N of each set; and

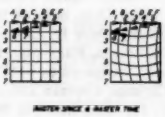
(b) a calculating frame including first and second frame sections each having three spaced boards extending generally parallel to each other and connected together with a side board, said spaced boards defining therebetween first and second grooves for receiving selected ones of said M

blocks, and means for joining said first and second frame sections together so that the first and second grooves in the first frame section are continuous and in respective alignment with the first and second grooves of the second section, said joining means including a pair of connectors each formed with protuberances and respectively engageable with selected ones of said spaced boards in each first and second frame section for joining same together, said first board in said first section having a display edge divided by indicia into M/2 lattices containing respectively consecutive numbers beginning with "1", said first board in said second section also including a display edge divided by indicia into M/2 lattices respectively containing consecutive numbers starting with M/2+1, said second board of the first section being divided into M/10 lattices respectively containing numbers increasing by "5" to M/2, said second board of said second section also being divided into M/10 lattices respectively containing numbers increasing by "5" from M/2+5 to M, said third board of the first section being divided into M/20 lattices respectively containing numbers increasing by "10" to M/2, said third board of said second section also being divided into M/20 lattices respectively containing numbers increasing by "10" from M/2+10 to M, said lattices enabling a user to carry out addition, subtraction, multiplication, division and learn fractional relationships by positioning suitable ones of said M blocks into the first and second grooves to thereby deduce mathematical relationships with reference to said lattices.

4,518,360
DEVICE TO COMPENSATE FOR DISTORTION IN TARGET LOCATION IN A VISUAL SYSTEM

Robert A. Fisher, Endicott, and David L. Peters, Whitney Point, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 276,225, Jun. 22, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,099
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—20 **21 Claims**



2. A device to compensate for distortion in target location in a visual system, comprising:

display means to present a visual target to a trainee;

computer image generator means to provide information to said display means as to the location of said visual target in accordance with a predetermined grid count and to provide a first signal in response to said grid count;

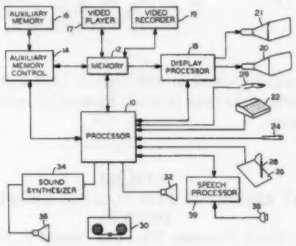
separate circuit means, responsive to the predetermined grid count to define an aiming point of said computer image generator means, to generate a second signal also in response to said grid count; said last mentioned grid count measuring the actual location of the aiming point on a distorted display as it appears visually to the user; and

comparator circuit means to generate one predetermined signal at a point in time, determined by said trainee, when there is coincidence between said first and said second signals and to generate another predetermined signal at another point in time, determined by said trainee, when there is no coincidence between said first and said second signals.

4,518,361
METHOD AND APPARATUS FOR EFFECTING AND EVALUATING ACTION UPON VISUAL IMAGING

Malcolm J. Conway, Main Rd., Gill, Mass. 01376

Filed Aug. 5, 1982, Ser. No. 405,601
Int. Cl.³ G09B *7/04*
U.S. Cl. 434—307 **31 Claims**



1. In a method for developing an individual's capacity to form and utilize accurate mental images of data to which the subject has been previously exposed, the steps comprising:

a. providing an electronically generated visual display of an environment simultaneously including a plurality of distinctive datum references within the displayed environment which may be acted upon by the subject;

b. providing data processing means with data storage means containing predetermined information relative to said datum references of said display including (i) a first condition of each said datum reference to be acted upon, (ii) an instruction for action on each such datum reference to be acted upon, said instruction requiring at least two dimensions of action upon the datum reference, and (iii) at least a second condition of each such datum reference to be representing the result of at least two dimensions of action upon each such datum reference acted upon and following proper execution of the instruction with respect thereto;

c. providing means for manipulation by the subject coupled to said data processing means to electronically record in said data storage means the action to change said datum references of said visual display;

d. highlighting at least one of said datum references of said display and providing an instruction to the subject requiring an action with said manipulatable means to change at least said one of the highlighted datum references of said visual display, said action requiring at least two dimensions of manipulation with said manipulation means as to each such datum reference acted upon;

e. electronically recording at least two dimensions of the actions of the subject on the hightlighted datum references in response to the instruction to change any highlighted datum references of said visual display;

f. comparing the recorded dimensions of the subject's action on the appropriate datum reference with the predetermined dimensions for change in condition of such datum reference in proper response to the given instruction; and

g. presenting to the subject the results of such comparison.

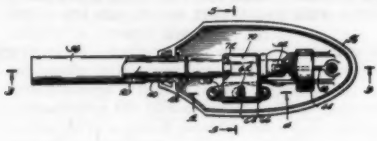
4,518,362
OPERATION CONTROL FOR ELECTRIC OUTBOARD MOTOR

Wallace R. Johnson, Mundelein, and W. Wayne Beem, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 25, 1983, Ser. No. 516,571
Int. Cl.³ B60L *11/02*
U.S. Cl. 440—6 **14 Claims**

1. An electric outboard motor having a control head in which a steering tiller is mounted for limited rotational and axial movement relative to and within said control head, a first

switch located in said control head and operated by rotation of the tiller to regulate operation and speed of the motor, and a



second switch located in said control head and operated by axial motion of the tiller to select forward or reverse operation of the motor.

4,518,363

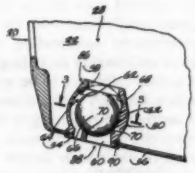
VENT ASSEMBLY FOR MARINE PROPULSION DEVICES

Gerald F. Bland, Kenosha, Wis., and Donald K. Sullivan, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 349,177, Feb. 16, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 570,417

Int. Cl.³ B63H *21/34*

U.S. Cl. 440—89 **2 Claims**



1. A marine propulsion device comprising a propulsion assembly including a lower unit having a gear case normally submerged in water and carrying a rotatably mounted propeller, an upper unit including a powerhead housing normally located above the water, defining an engine compartment, and including a lower wall having therein an aperture surrounded by a marginal wall portion, an internal combustion engine disposed inside said engine compartment and drivingly connected to said propeller, a tubular member fabricated of resilient material, extending vertically, and including an upper part with an upper port communicating with said engine compartment, a lower part having an outer surface including a circumferentially extending annular groove receiving said marginal wall portion and an inner surface defining a lower port communicating with the atmosphere, said lower part being deformable from a normal size to a collapsed smaller size affording snap-in receipt of said marginal wall portion into said annular groove and to a stretched larger size, and a passage portion intermediate said upper and lower parts and including a valve seat facing downwardly, and a bulbous part below said valve seat, and a buoyant ball valve member disposed in said bulbous part of said passage portion, having a size greater than said normal size and smaller than said stretched larger size to permit insertion of said ball valve member into said bulbous part of said passage portion, and being movable between a lower open position wherein said ball valve member is supported in spaced relation from said valve seat in response to gravitational force, whereby to afford fluid flow between said engine compartment and the atmosphere, and an upper closed position wherein said ball valve member is in sealing engagement with said valve seat in response to water entering said lower port and rising in said passage portion, whereby to prevent water flow into said engine compartment.

4,518,364

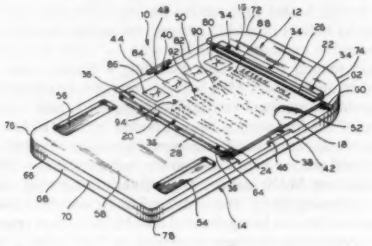
SWIMMING INSTRUCTION DEVICE

Vivian R. Jacobson, 3557 W. Hollywood Ave., Chicago, Ill. 60659

Filed Sep. 30, 1983, Ser. No. 537,804

Int. Cl.³ A63B *31/00*

U.S. Cl. 441—129 **7 Claims**



1. A swimming instruction device, comprising;

a kickboard having a top surface and a bottom surface, said kickboard being buoyant to float on water with at least a portion of said bottom surface in contact with the water and said top surface facing upwardly and away from the water, said kickboard including means for selective attachment of swimming instruction to said top surface thereof,

said means for selective attachment of swimming instructions including a plurality of guide members adapted to receive a swimming instruction card:

said guide members being disposed in spaced parallel relation on said top surface of said kickboard, said guide members each including a card retaining flange extending toward the other of said guide members.

4,518,365

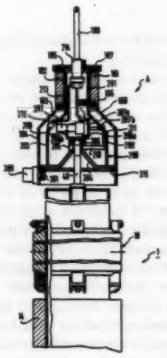
DEVICE FOR NIPPLING ACTIVE ELECTRODE SECTIONS ONTO A COMBINATION ELECTRODE

Kurt Schudlich, Witten-Annen; Günter Vielstich, Witten-Heven; Josef Mühlenbeck; Josef Otto, both of Wetter; Hannsgeorg Bauer, Witten-Bommern; Dieter H. Zöllner, Schwaig b. Nürnberg, and Friedrich Rittmann, Rückersdorf b. Nürnberg, all of Fed. Rep. of Germany, assignors to ARC Technologies Systems, Ltd., Grand Cayman, Cayman Islands

Filed Apr. 13, 1982, Ser. No. 367,871

Int. Cl.³ H01J *9/18*

U.S. Cl. 445—67 **19 Claims**



1. A coupling device for nippling and denippling active

consummable electrode sections of a combination electrode joined by means of screw nipples comprising:

an outer, essentially hollow cylindrical element and a second element also essentially hollow and cylindrical, arranged coaxially within said outer element;

the inner element including locking means controllable for detachably engaging a connector element affixed to a combination electrode, and an insertion means having a wall element narrowing in a direction of insertion of the connector element into the coupling device to align the connector element with the locking means; the outer element having a suspension means shockabsorbingly movable along the insertion direction; and

a drive configured to rotate the inner element in relation to the outer element around the co-axis.

4,518,366

MANIPULABLE DOLL

Carl Fultz, Jr, and Phyllis D. W. Fultz, both of 315 Summerwood Dr., Bristol, Tenn. 37620

Filed Mar. 16, 1983, Ser. No. 475,856

Int. Cl.³ A63J *19/00*; A63H *3/20*

U.S. Cl. 446—366 **8 Claims**

1. An improved manipulable doll for reproducing lifelike human or animal movement while being operated by a human operator, said doll comprising:

a torso member having a lower waist portion and an upper end portion, and provided with a centrally located annular recess oriented substantially perpendicular to a line joining said waist portion and said upper end portion of said torso member;

a head portion including an integrally formed neck portion, said neck portion being centrally located on and fixedly engaged to said upper end portion of said torso member;

a universally flexible connecting medium for enclosing said torso member and giving said doll lifelike appearance, said connecting medium being provided with a first opening for receiving said neck portion of said torso member and a second opening corresponding to said annular recess of said torso member, said connecting medium further comprising a pair of arm portions, each said arm portion having a free end portion, and a pair of leg portions, each said leg portion having a free end portion;

a pair of hand members, each said hand member being fixedly engaged to said free end portion of said arm portion of said connecting medium, said connecting medium functioning as sole connection between said hand members and said torso member;

a pair of foot members, each said foot member being fixedly engaged to said free end portion of each said leg portion of said connecting medium, said connecting medium functioning as sole connection between said foot members and said torso member;

a manipulator rod having a first end portion being slidably received through said second opening in said connecting medium and releasably received in said annular recess of said torso member, and a second end portion for being grasped by said operator in operating said doll; and

a support board for flexibly supporting and vibrating said doll as it is operated by said operator.

4,518,367

FIGURE INCLUDING MEANS FOR EXTRUDING PLASTIC SUBSTANCE

John V. Zaruba, Chicago, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 19, 1983, Ser. No. 543,408

Int. Cl.³ A63H *3/36*

U.S. Cl. 446—373 **11 Claims**

1. An activity toy comprising:

a figure with a body supporting an upper member including a hollow skull;

extrusion openings in the skull in one or more of the eye, nose, and mouth areas;

a loading opening for inserting a plastic substance into the hollow skull;

extrusion means cooperating with the loading opening in said member for forcing the plastic substance into the hollow skull and out of the extrusion openings; and

a removable clear mask, means for attaching the mask about the skull with the interior of the mask spaced from the skull in the area of the openings and in a relatively tight fit with another portion of the member to substantially prevent the flow of the plastic substance out of the mask.

4,518,368

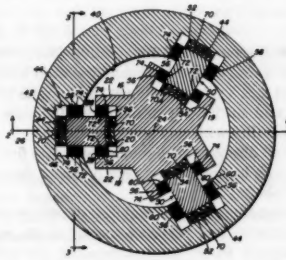
COUPLING

Mark F. Peretti, Braintree, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Jun. 8, 1983, Ser. No. 502,217

Int. Cl.³ F16D *3/50, 3/52*

U.S. Cl. 464—70 **12 Claims**



1. A coupling device comprising, in combination:

a driving member mounted for rotation about a first axis;

a driven member mounted for rotation about a second axis;

a plurality of intermediate floating members circumferentially spaced around said first and second axes and coupling said driving and driven members so that said first and second axes tend to intersect at a common point when axially misaligned, each of said floating members being elongated in one direction and having (1) an elongated central axis extending radially with respect to said first and second axes through said common point and lying in a common plane with the elongated central axes of the

other ones of said floating members, (2) an outer radial end defined by a convex spherical end surface having a center of curvature coincident with said common point, and (3) an inner radial end defined by a concave spherical end surface having a center of curvature coincident with said common point;

first means for coupling the inner radial end of each of said floating members to one of said driving and driven members, said first means including bearing means disposed between each said floating member and said one member; and

second means for coupling the outer radial end of each of said floating members to the other of said driving and driven members, said second means including bearing means disposed between each said floating member and the other of said driving and driven members;

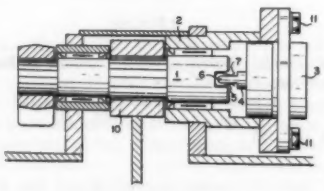
wherein said bearing means of said first and second means carries in compression torque transmitted between said driving and driven members and accommodates relative pivotal motion between said driving and driven members about said common point.

4,518,369

COUPLING ARRANGEMENT FOR ROTATING SHAFTS

Mitsuhisa Shinsen, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,828
Int. Cl.³ F16D *3/52*
U.S. Cl. 464—101 **1 Claim**



1. A coupling arrangement for rotating shafts, comprising:

a first shaft having an end face, said first shaft having formed in the end face a slit extending at right angles with the axis thereof, said slit having straight, parallel sides and a flat bottom parallel with said end face;

a second shaft disposed in alignment with said first shaft, said second shaft having an end face opposite the end face of said first shaft;

a tongue extending from the end face of said second shaft in alignment with said first and second shafts, said tongue being adapted to be inserted into the slit with enough clearance and said tongue further having tapered edges at its outermost end; and

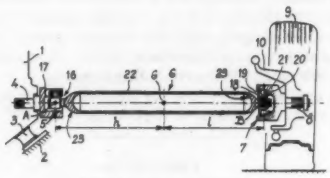
leaf spring means adapted to be inserted into the slit for coupling against rotation between said first and second shafts through said tongue, said leaf spring means having a crown and two leg portions, the crown being inserted into the slit and the two leg portions being adapted to clamp said tongue in such a manner that no relative rotary motion occurs between said first shaft and said tongue, said tongue also having two flat surfaces parallel to each other and to the axis thereof such that said two leg portions of said leaf spring means clamp the respective flat surfaces.

4,518,370

TRANSMISSION FOR A MOTOR VEHICLE

Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed May 23, 1983, Ser. No. 497,011
Claims priority, application France, May 26, 1982, 82 09152
Int. Cl.³ F16D *3/22;* F16C *3/00*
U.S. Cl. 464—113 **8 Claims**



1. A motor vehicle transmission comprising:

a driving shaft;

a driven shaft;

a transmission shaft extending between said driving and driven shafts;

first and second constant-speed joints respectively connecting opposite ends of said transmission shaft to said driving shaft and to said driven shaft; and

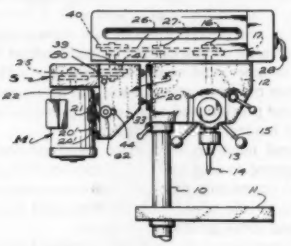
means for preventing radial vibration of said driving shaft from being transmitted to said driven shaft, said means comprising a construction of a unit comprising said transmission shaft and elements of said first and second joints connected to said transmission shaft such that said unit has a moment of inertia, about an axis perpendicular to said transmission shaft and passing through the center of gravity of said unit, substantially equal to the product of the mass of said unit, the distance from the center of articulation of said first joint to said center of gravity, and the distance from the center of articulation of said second joint to said center of gravity.

4,518,371

POWER TOOL DRIVE ATTACHMENT

David K. Hanson, 861 Glenhaven Dr., La Habra, Calif. 90631

Filed Sep. 12, 1983, Ser. No. 531,039
Int. Cl.³ F16H *7/14*
U.S. Cl. 474—114 **16 Claims**



1. A belt drive attachment for motor driven machines comprising a vertical frame with top and bottom ends, spaced front and rear ends and spaced sides, a substantially flat mounting wall at the upper forward portion of the frame to engage and be fastened to a motor mounting pad on a related machine, bearing means within the frame, an elongate countershaft rotatably carried by the bearing means and having a portion projecting from the frame and a portion within the frame, a mounting plate at the lower rear portion of the frame to releasably cooperatively engage a motor mounting frame of a related

motor, hinge means pivotally connect the plate to the frame for pivotal movement of said plate and a related motor relative thereto, clamp means engaged with and between the frame and the plate and releasably hold the plate in fixed pivotal position, a multi-diameter/multi-sheave input pulley wheel is drivingly engaged on the portion of the shaft within the frame, a drive belt is engaged about and between the input pulley wheel and a complimentary multi-diameter/multi-sheave pulley wheel on the drive shaft of a related motor mounted on the plate and a multi-diameter/multi-sheave output pulley wheel is drivingly engaged on the portion of the countershaft projecting from the frame and is engageable with a drive belt engaged with and extending from a multi-diameter/multi-sheave driven pulley wheel on a driven shaft on a related machine spaced from the output pulley wheel.

4,518,372

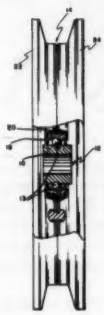
IDLER PULLEY AND METHOD OF MOUNTING A PRECISION BEARING

Donald D. Dye, P.O. Box 107, Kingman, Kans. 67068

Filed Oct. 24, 1983, Ser. No. 544,539

Int. Cl.³ F16H *55/14*

U.S. Cl. 474—94 **10 Claims**



1. A pulley device having a bearing of precise dimensional tolerance supported in a sheave of less precise tolerance comprising a pair of substantially identical disc-like elements of opposite hand flushing against each other at an inner contact point that terminates into an inner circular structure whose vertical cross-section along any point of the perimeter of the inner circular structure generally defines a Y-shape with a pair of arms flaring from a flare point that represents a groove;

a roller bearing means having an inner race and an outer race, said roller bearing means lodging within said inner circular structure such that said outer race is encased within and is in contact with outer ends of the pair of arms of said Y-shaped cross section of said inner circular structure on the outside of said outer race;

an elastic ring means under compression and supported by the outer race and lodged in said groove of said flare point in contact with inner end portions of said pair of arms and with space on each side of said ring between said arms and the outer surface of said outer race, said elastic ring means receiving a compressive load when the main body of the radial load on the pulley is transmitted along said inner contact point to the roller bearing means through said elastic ring means.

4,518,373

SELF TENSIONING BELT DRIVE

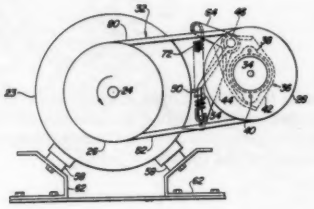
Wolfgang Roth, Zweibrucken, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Mar. 31, 1983, Ser. No. 481,094

Claims priority, application European Pat. Off., May 13, 1982, 82104160

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—109 **5 Claims**



1. A belt drive for a machine having a power source and a frame comprising:

a driver sheave rotatably mounted on the frame and drivably connected to the power source;

a driven sheave rotatably carried by the frame and drivably connected to a driven element, said element having an axis of rotation and imposing a variable load on the belt drive;

a drive belt trained around the respective sheaves for transmitting power between them, said belt having a tight side and a slack side, and said tight side engaging the driven sheave so as to define a line of action for the belt spaced at a given effective radius from the center of the driven sheave; and

mounting means for mounting the driven sheave on the frame for oscillation about a pivot axis, said pivot axis being spaced from the axis of rotation of the driven element and disposed generally parallel to the axis of rotation of the driven sheave and lying between said axis and the line of action of the tight side of the belt so that the mounting means is directly mechanically responsive to the load imposed on the driven sheave by the driven element so that an increase of load biases the driven sheave away from the driver sheave so as to increase the effective tension of the belt, the pivot axis being disposed so that the biasing of the driven sheave responsive to an increase in drive load is in a direction tending to decrease the ratio of the effective radius to the distance from the pivot to the line of action.

4,518,374

POLY-V PULLEYS

Yukio Kanemitsu, Hyogo, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan

Filed Jul. 21, 1982, Ser. No. 400,415

Claims priority, application Japan, Dec. 24, 1981, 56-212370

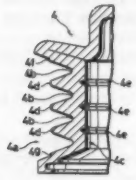
Int. Cl.³ F16H *55/49*

U.S. Cl. 474—170 **2 Claims**

1. A poly-V pulley formed from a sheet metal cup-shaped blank, comprising:

a cylindrical wall of continuous material, with inner and outer peripheral surfaces, a portion of the cylindrical wall being thicker than remaining sheet metal material from the blank, the thicker portion having a plurality of deep, parallel V-shaped annular grooves in the outer peripheral surface, alternating with parallel, annular partition walls, the alternating annular grooves and partition walls being adapted for receiving poly-V belts, the inner peripheral surface of the thickened portion having a plurality of shallow V-shaped annular grooves of triangular cross-section arranged parallel to one another and aligned between

the grooves of the outer peripheral surface, the inner peripheral surface being flat between said shallow V-shaped annular grooves; and,



annular flanges at opposite ends of the thicker portion projecting radially beyond the partition walls, the flanges having peripheral steps for secure engagement between the pulley and the poly-V belts.

4,518,375

TOOTHED BELT

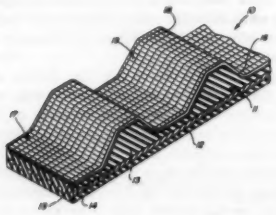
Satoshi Mashimo, Akashi; Masayuki Tanaka, and Yoshio Yamaguchi, both of Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Jan. 25, 1983, Ser. No. 460,921

Claims priority, application Japan, Jan. 27, 1982, 57-11967

Int. Cl.³ F16G *1/28*

U.S. Cl. 474—205 **24 Claims**



1. In a drive belt having an elongate belt body provided with a longitudinally extending tension member and a drive portion defined by a plurality of longitudinally spaced projecting teeth, the improvement comprising:

a first layer of elastic yarn extending spirally longitudinally of the belt body on the surface of said teeth; and projecting

a second layer of cloth on said first layer, said cloth having an elastic warp of greater than 50% ductility extending longitudinally of the belt.

4,518,376

POWER TRANSMISSION BELT MANUFACTURE

Satoshi Mashimo, Akashi; Hazime Kakiuchi, Itami, and Masayoshi Nakajima, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Continuation of Ser. No. 203,716, Nov. 3, 1980, abandoned. This application Jun. 22, 1984, Ser. No. 623,619

Claims priority, application Japan, Nov. 8, 1979, 54-145280

Int. Cl.³ F16G *5/00, 1/22*; F16H *7/00*; C08K *3/36*

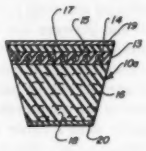
U.S. Cl. 474—261 **13 Claims**

1. In a belt having a load-carrying section provided with load-carrying cords, an improved cushion having a high strength bond with said cords embedded therein, said cushion being formed of a modified rubber blend, comprising:

(a) about 100 parts by weight chloroprene rubber,

(b) about 0.1 to 5.0 phr of silane coupling agent,

(c) about 10–60 phr silica,



(d) about 0.3 phr sulphur containing cross-linking agent, and

(e) about 2–60 phr carbon black.

4,518,377

METHOD OF MAKING A CARTON

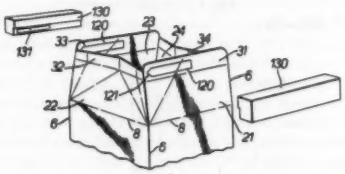
Edward A. Skinner, Welwyn Garden City, England, assignor to Elopak Limited, Hertfordshire, England

Filed May 10, 1982, Ser. No. 376,557

Claims priority, application United Kingdom, May 11, 1981, 8114277

Int. Cl.³ B31B *1/64*

U.S. Cl. 493—58 **8 Claims**



1. A method of making a carton, comprising the steps of:

providing a sheet material defining a planar first surface having first, second, third and fourth portions;

embossing said sheet material to cause said fourth portion to lie out of the plane of said surface but substantially parallel thereto to define a corresponding depression in said one surface;

folding said embossed sheet material;

bringing said first and second portions together face-to-face;

bringing said third and fourth portions together face-to-face;

adhering said first and second portions together by introducing the first, second, third and fourth portions between the jaws of a pair of jaws; and

pressing the first and second portions together by means of the jaws while the fourth portion is situated at a recess in one of the jaws so as not to bear firmly on the third portion.

4,518,378

APPARATUS FOR THE MANUFACTURE OF PLASTIC BAGS

Ehrhart Schulze, Fellbach, and Franz Bochtler, Rudersberg, both of Fed. Rep. of Germany, assignors to Karl Heinz Stiegler, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 336,566

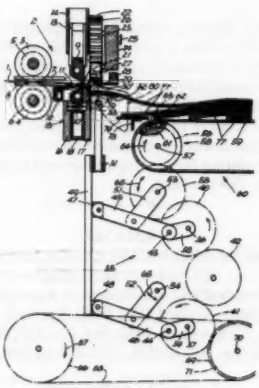
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100722

Int. Cl.³ B31B *1/16, 23/14*

U.S. Cl. 493—204 **6 Claims**

1. An apparatus for the manufacture of plastic bags from a web of tubular film and for stacking the resultant bags, which apparatus includes in combination means including an array of air jets for advancing cyclically a predetermined length of said

web, sealing bars mounted on opposite sides of the path of said length of said web for cooperative movement into and out of seal producing engagement with said web length transverse thereto for producing bottom seams of the bags, means for severing a completed bag from said web adjacent the seam for a succeeding bag, a stacking station in the advancing direction of said web beyond said severing means, an intermittently operable transporter for transporting stacks of bags away from said stacking station, and means for transferring a stack of said bags from said stacking station to said transporter, characterized in that said stack transferring means comprises a single array of needles mounted for movement between said stacking station and a transfer station adjacent said transporter for moving the impaled end of a stack of said bags toward said transporter simultaneously and in coordination with transporter operation, means for advancing said transporter in synchronism with said needle stacking-station-to-transfer-station movement for moving the opposite end of said stack simultaneously with said needle movement, means for interrupting said transporter advancing movement when said needles reach said transfer station, a drive mechanism operatively coupled to said array of needles, said drive mechanism including a first crank and means linking said first crank to said needles for converting a single revolution of said first crank into a closed loop movement of the tips of said needles from said stacking station to said transfer station along a path above both of said stations and then below both of said stations to return to said stacking station, and a second crank mounted for rotation in parallel synchronism with and in the same plane as said first mentioned crank, each crank having pivotally joined thereto a connecting link joined at its other end to a common support for said needles, and a separate rocker arm joining an intermediate point of each of said connecting links, respectively, to a corresponding fixed pivot point, said connecting links operating in parallel and said rocker arms acting in parallel, said drive mechanism being coordinated with the operation of said web advancing means and said sealing bars for extracting said needles from said stack after said length of web has been advanced and said sealing bars have assumed their seam producing position and created a barrier to air from said air jets reaching said transporter supported stack, said needles reaching said stacking station prior to completion of said seam production, and means for impaling on said needles at said stacking station the end of each bag adjacent the line of severance from said web in coordination with such severance.

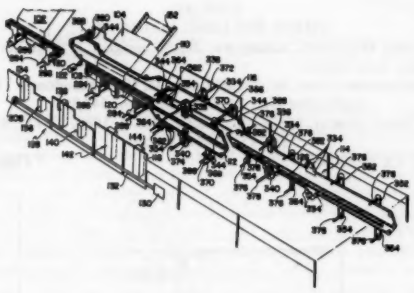


4,518,379

APPARATUS AND METHOD FOR JOINING INDIVIDUAL BLANKS

Charles W. Eldridge, Beverly, Mass., assignor to Melvin B. Herrin, Meadowbrook, Pa.

Filed Dec. 28, 1981, Ser. No. 334,585
Int. Cl.³ B31B *17/02*
U.S. Cl. 493—334 **36 Claims**



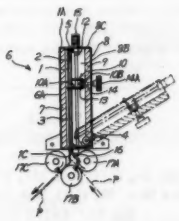
1. An apparatus for joining individual blanks together and having an operative direction, said individual blanks being conveyed through said apparatus along said operative direction, said apparatus comprising means for providing a first and second blank of self-supporting material, means for displacing at least a portion of said first blank substantially along said operative direction of said apparatus and away from at least a portion of said second blank, and means for arranging said first and second blanks such that said displaced portion of said first blank is arranged in alignment with a portion of said second blank such that said blanks can be joined together in said alignment by a bonding agent provided therebetween.

4,518,380

PAPER FOLDING DEVICE

Masaaki Shimizu, Tokyo, and Akira Aihara, Kyoto, both of Japan, assignors to Horizon Co., Ltd., Kyoto, Japan

Filed Feb. 21, 1984, Ser. No. 581,696
Claims priority, application Japan, Feb. 28, 1983, 58-33288
Int. Cl.³ B31B *1/64*
U.S. Cl. 493—420 **7 Claims**



1. A device for folding a sheet of paper, comprising:

a pair of wing members;

means for holding each of said wing members for pivotal movement between an open position and a closed position;

a gap formed between said wing members in said closed position, said gap being dimensioned so that a sheet of paper to be folded may be inserted into said gap;

a stopper disposed in the gap so as to be displaceable in the direction of movement of said sheet of paper inside said gap;

a pair of sound absorbing members each arranged behind

one of said pair of wing members for simultaneous opening and closing movement therewith; and

roller means arranged adjacent the entrance of said gap for feeding a sheet of paper to be folded into said gap and folding said sheet of paper at a bent portion caused outside said gap upon hitting of the forward edge of said sheet of paper on said stopper inside said gap.

4,518,381

SHEET FOLDING MACHINE

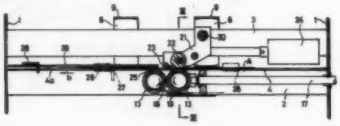
Susumu Wakatsuki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Continuation of Ser. No. 305,318, Sep. 24, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 543,806

Claims priority, application Japan, Oct. 1, 1980, 55-135785

Int. Cl.³ B65H *45/18*

U.S. Cl. 493—444 **7 Claims**



1. A sheet folding machine comprising:

a pair of sheet folding rollers positioned along a sheet conveying path and having their respective axes of rotation in a direction parallel to a sheet conveying direction in said sheet conveying path said sheet folding rollers having a nipping region therebetween to grasp and direct a portion of a sheet in a direction generally perpendicularly to a plane of said sheet conveying path;

a sheet stopper provided along the sheet conveying path for limiting widthwise displacement of said sheet within said plane of the sheet conveying path;

an idler roller having an axis of rotation parallel to said sheet conveying direction and positioned to depress a sheet against one of said sheet folding rollers to effectuate widthwise displacement of said sheet within said plane and in a direction perpendicular to said sheet conveying direction to abut said sheet against said sheet stopper;

means for bending a sheet into said nipping region;

means for selectively moving said idler roller and said means for bending into an operative position relative to said pair of sheet folding rollers at nipping region; and

control means for detecting the delivery of said sheet to said pair of folding rollers and operating said means for selectively moving said idler roller and said means for bending to fold said sheet by nipping action of said sheet folding rollers.

4,518,382

APPARATUS FOR COLONIC AND INTESTINAL IRRIGATION

Ingrid B. Bloxom, Jr., P.O. Box 357, Wicomoco, Va. 23184

Filed Nov. 29, 1983, Ser. No. 556,036

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—27 **6 Claims**

1. An apparatus for controlled intestinal irrigation comprising:

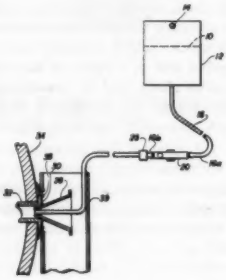
(a) a container means for supply and storage of irrigating liquid,

(b) introduction means positionable adjacent to and in fluid delivering relation with an entrance to an intestine being irrigated for introducing liquid thereto,

(c) conduit means disposed in interconnecting and fluid communicating relation between said container means and said introduction means,

(d) flow regulating means connected to said conduit means and structured and disposed to stop and control liquid flow from said container means to said introduction means, whereby flow of irrigating fluid to the intestine is selectively stopped by said flow regulating means upon an indication of peristaltic action of the intestine by a flow indicator,

(e) a flow indicator means connected to said conduit means between said container means and said introduction means and structured to accommodate liquid flow therethrough from said container means to the intestine and reversely from the intestine into said flow indicator means,



(f) said flow indicator means first structured for visual observation of at least a portion of the interior thereof and including an indicator element movably disposed therein and within liquid flow passing therethrough,

(g) said indicator element cooperatively structured and disposed relative to said flow indicator means for responsive displacement therein based on peristaltic action of the intestine during flow of liquid through said flow indicator means to the intestine.

4,518,383

INSTRUMENT AND METHOD FOR EPIDURAL AND SPINAL ANAESTHESIA

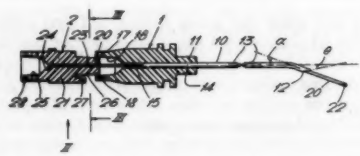
John M. Evans, Nuffield Department of Anaesthetics, The Radcliffe Infirmary, Oxford OX2 6HE, England

Filed Aug. 2, 1983, Ser. No. 519,788

Claims priority, application United Kingdom, Aug. 6, 1982, 8222799

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—51 **12 Claims**



1. A medico-surgical instrument for use in epidural and spinal anaesthesia comprising: an outer hollow needle assembly having a hollow outer needle the forward end of which is bent away from the longitudinal axis of the instrument and has an inclined pointed tip, and a hub mounted at the rear of said outer needle, said hub having an engagement member provided therewith; and an inner hollow needle assembly having a hollow inner needle the forward end of which has an inclined pointed tip, and a hub mounted at the rear of said inner needle, the said hub of said inner assembly having an engagement member provided therewith that cooperates with the engagement member of the hub of said outer assembly so as to define a predetermined relative angular orientation between the inner and outer needle assemblies, the length of the inner needle being such that it projects beyond the forward end of the outer

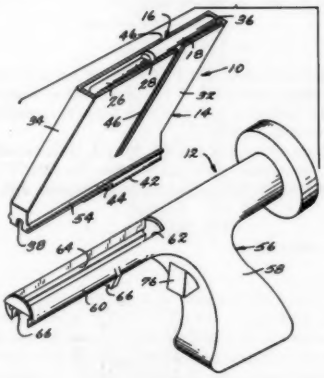
needle when said engagement members are in cooperation, and the relative angular orientation of the outer and inner needle assemblies being such that the plane of the inclined pointed tip of the inner needle is substantially at right angles with plane of the inclined pointed tip of the outer needle.

4,518,384

MULTIPLE MEDICAMENT CARTRIDGE CLIP AND MEDICAMENT DISCHARGING DEVICE THEREFOR

William R. Tarello, Bethesda; Claudio Lopez; Linda A. Gordon, both of Silver Spring; Thomas D. Whalen, Rockville, and William B. Harvey, Olney, all of Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Jun. 17, 1983, Ser. No. 505,323
Int. Cl.³ A61M *5/18*
U.S. Cl. 604—61 **41 Claims**



1. An expendable medicament cartridge containing clip for use with a portable medicament discharging device having a cartridge receiving station and a medicament discharging mechanism movable through successive cycles each of which includes a medicament discharging stroke through said cartridge receiving station when a medicament cartridge is positioned in said station, said clip comprising

a series of medicament cartridges, each of said cartridges comprising

a container,

a dosage of medicament in said container,

a hypodermic needle having a sharpened end for penetrating the muscle tissue of a patient and an opposite end through which the dosage of medicament is fed,

means for sealingly containing said needle in a sterile condition in cooperating relation with said container, and

means at one end of said container operable in response to a discharging stroke of said medicament discharging mechanism when in the cartridge receiving station thereof to cause the sharpened end of said needle to move outwardly out of sealingly contained relation and into the muscle tissue of a patient and said medicament dosage to move outwardly of said container into the opposite end of said needle and out of the sharpened end thereof into the muscle tissue of the patient,

casing means for retaining said series of cartridges in a unitary condition suitable for manual handling and connection with said medicament discharging mechanism, and

means operable when said casing means is connected with the discharging mechanism for enabling successive medicament cartridges retained in said casing means to be moved into the cartridge receiving station of the discharging mechanism.

4,518,385

DISPOSABLE SYRINGE FOR NEEDLELESS INJECTOR

Istvan Lindmayer, Pierrefonds, and Raymond M. Grunwald, Dollard des Ormeaux, both of Canada, assignors to Preci-Tech Ltd., Ville St. Laurent, Canada

Filed Jun. 13, 1983, Ser. No. 503,765
Int. Cl.³ A61M *11/00*
U.S. Cl. 604—68 **12 Claims**

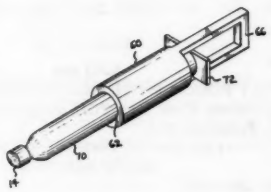
1. A disposable syringe for use in a needleless injector of the type including a casing, a piston slidably mounted in the casing for movement between a retracted position and an extended position, and drive means for driving the piston from the retracted to the extended position, the syringe comprising tubular plastic barrel means, said barrel means having an open inner end for insertion into said casing and a closed outer end for extending out of said casing; connector means for releasably retaining said barrel means in said casing; orifice means in said closed end of said barrel means for admitting medicine into said barrel means, plunger means slidably mounted in said barrel means, one end of said plunger means extending out of said open inner end of said barrel means for gripping whereby the plunger means can be moved away from said closed outer end of said barrel means to a loaded position in which medicine fills the space in said barrel means between said closed outer end and the other end of said plunger means, said one end of the plunger means being engageable by said piston, whereby the plunger means can be moved from the loaded position to a discharge position against said closed outer end of the barrel means to discharge substantially all of the medicine from said barrel means.

4,518,386

MEDICINE CONTAINER HAVING LYOPHILIZED POWDER AND DILUENT STORED IN SEPARATE SEALED CHAMBERS

John A. Tartaglia, 101 Pierpont Rd., Waterbury, Conn. 06705

Filed Aug. 31, 1983, Ser. No. 527,980
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—89 **7 Claims**



1. A medical device comprising:

a first elongated hollow cylinder having a first inner diameter, one end of the first cylinder being open, the other end of the first cylinder being provided with means for receiving a hypodermic needle and being otherwise sealed;

a second elongated hollow cylinder having a second and smaller inner diameter, the first and second cylinders being disposed end to end a long a common axis, one end of the second cylinder being open and disposed adjacent said one end of the first cylinder, the other end of the second cylinder being adapted to be detachably engaged by cylinder engaging means;

a sealing member disposed between and detachably engaging both cylinders, said member having a first cylindrical section having a diameter slightly smaller than said first

diameter with means disposed in slidable sealing engagement in said one end of the first cylinder, said member having a second cylindrical section having a diameter slightly smaller than said second cylinder with means disposed in slidable sealing engagement in said one end of the second cylinder, said first section means having a first coefficient of friction with respect to the inner wall of the first cylinder, said second section means having a second and higher coefficient of friction with respect to the inner wall of the second cylinder;

a first medicine disposed in the first cylinder; and

a second medicine disposed in the second cylinder.

4,518,387

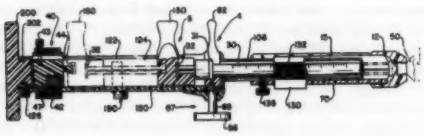
SYRINGE INJECTION APPARATUS WITH ADJUSTABLE DOSAGE INDICATOR

Frank Murphy, 285 Channelwood Cir., Apartment 506, Akron, Ohio 44307, and William F. Peterson, 2650 Eleventh St., Cuyahoga Falls, Ohio 44221

Filed Dec. 27, 1982, Ser. No. 453,601

Int. Cl.³ A61M 5/00

U.S. Cl. 604—187 **6 Claims**



1. A manual syringe injection apparatus, comprising:

a cylindrical tube;

a cylindrical needle guide attached to said tube by a sliding means at one end of said tube, said needle guide separating upon contact with a surface to tension such surface;

an elevator ejector attached to said tube in the center section of said tube; and

a piston assembly inserted inside of the other end of said tube, wherein a syringe is locked into said tube by said elevator ejector.

4,518,388

OSTOMY POUCH WITH REDUCED FRICTION INSERT

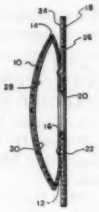
Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Princeton, N.J.

Filed Jun. 14, 1982, Ser. No. 388,177

Int. Cl.³ A61F 5/44

U.S. Cl. 604—332 **7 Claims**

1. An ostomy pouch comprising first and second pouch walls sealed along their contour, said first pouch walls having an aperture therein, an adhesive-backed label having an aperture, said label being heat-seal affixed to said one pouch wall, with said aperture therein aligned with said aperture in said one pouch wall, and an insert comprising non-heat-sealable material, said insert being situated within said pouch between the interior surfaces of said pouch walls substantially completely and permanently and affixed to the interior surface of



said second pouch walls in registration with the affixation of said label to said one pouch wall.

4,518,389

INTERDIGITATED COUPLING FOR AN OSTOMY BAG

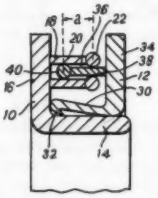
Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants, Limited, London, England

Continuation of Ser. No. 374,455, May 3, 1982, abandoned. This application May 2, 1984, Ser. No. 591,727

Claims priority, application United Kingdom, Jun. 26, 1981, 8119731

Int. Cl.³ A61F 5/44

U.S. Cl. 604—339 **6 Claims**



1. A coupling for joining an ostomy bag to a pad of adhesive material which can be applied to the wearer of the bag comprising:

(a) two coupling elements, each of which has a substantially cylindrical, hollow portion, said coupling elements being adapted to engage one another;

(b) an annular flange which extends laterally from said substantially cylindrical, hollow portion of each of said coupling elements;

(c) an internal, inwardly extending flexible sealing skirt which is an integral part of said cylindrical, hollow portion of one of said coupling elements, said sealing skirt being configured to engage and make sealing engagement with the external surface of said cylindrical, hollow portion of said other coupling element; and

(d) a plurality of pins extending in an axial direction from each of said flanges, said pins each having a head and shank configuration adapted to engage with a similar pin on said other coupling element, whereby the combination of said sealing skirt and said pins provides an easily removable, yet easily sealable apparatus for an ostomy product.

4,518,390

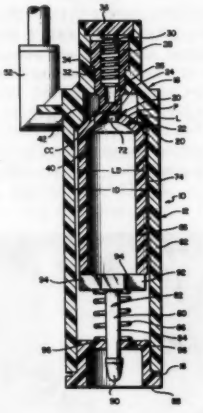
LENS TINTING FIXTURE AND SYSTEM UTILIZING SAID FIXTURE

Richard Rabenau, and Jeffery A. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala. and National Patent Development Corporation, New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,694

Int. Cl.[3] **B05C** *3/00, 19/02;* **G03B** *21/46;* **B05D** *5/06*

U.S. Cl. 8—507 **30 Claims**



24. A method of tinting a contact lens by using a tube-like structure which is closed at one end by structure which includes mask means and which is open at the other end, the method comprising the steps of; orienting the tube-like structure in a first position with the open end upward; adding a fluid column to the interior of said tube structure; dropping the lens to be tinted into the fluid in the tube, and permitting the lens to sink through the fluid column, so as to cause the lens to orient and center itself relative to the tube, permitting the oriented and centered lens to come to rest on mask structure defined in the tube bottom, inserting a mandrel member into the tube and fluid to secure the lens in place between the mandrel and the mask structure, applying a dye tinting medium to unmasked portions of the secured and masked lens.

4,518,391

MONOAZO COMPOUNDS HAVING A SULFO GROUP-CONTAINING DIAZO COMPONENT RADICAL AND A 6-(2'-CHLORO-1',3',5'-TRIAZIN-6'-YLAMINO)-1-HYDROXY-3-SULFONAPHTHALENE COUPLING COMPONENT RADICAL HAVING A SUBSTITUTED AMINO GROUP IN THE 4'-POSITION

Guenther Aüerbach, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

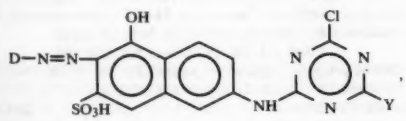
Filed Sep. 12, 1983, Ser. No. 530,941

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234505

Int. Cl.[3] **C09B** *62/08, 29/30;* **D06P** *1/38, 3/66*

U.S. Cl. 8—549 **20 Claims**

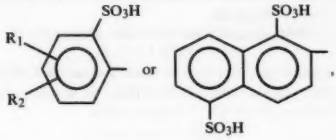
1. A compound of the formula



or a salt thereof each cation of which is independently a non-chromophoric cation,

wherein

D is

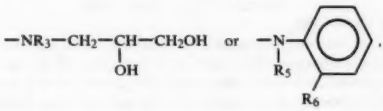


wherein

R_1 is hydrogen or sulfo, and

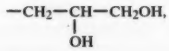
R_2 is hydrogen, halo, methyl, methoxy or acetamido, and

Y is



wherein

R_3 is hydrogen or



R_5 is C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by chloro, cyano or hydroxy, and

R_6 is halo, C_{1-4}alkyl or C_{1-4}alkoxy,

or a mixture of such compounds in free acid or salt form each cation of which is independently a non-chromophoric cation.

4,518,392

PROCESS FOR THE HT DYEING OF POLYESTER MATERIALS WITH ETHYLENE OXIDE PROPYLENE OXIDE BLOCK POLYMER

Hans Mollet, Reinach, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jul. 8, 1983, Ser. No. 512,093

Claims priority, application Switzerland, Jul. 15, 1982, 4305/82

Int. Cl.[3] **C09B** *67/00*

U.S. Cl. 8—609 **6 Claims**

1. A process for the HT dyeing of polyester fibre material with dyes which are sparingly soluble in water, which process comprises the use of a dyebath which contains at least one block polymer of ethylene oxide and propylene oxide having a molecular weight higher than 5000.

4,518,393

COAL BASED CEMENT COVER FOR COAL PILE

Gerald F. Pace, and Terry S. Cantu, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 21, 1983, Ser. No. 553,447

Int. Cl.[3] **C10L** *9/00*

U.S. Cl. 44—6 **6 Claims**

1. A method for prevention of spontaneous combustion in a pile or mass of coal made up of heterogeneous particles substantially free from one another by covering said coal pile or mass, comprising

(a) forming a slurry of coal from coal fines, a carrier and an effective amount of sodium silicate,

(b) placing the slurry formed on the exposed surface of said coal pile in sufficient quantity that the slurry penetrates

the coal pile to a depth sufficient to substantially exclude atmospheric air, and

(c) allowing the slurry to dry to form a hard, sodium silicate-coal cement, wherein the total sodium present based on the coal covered is sufficiently low to avoid slagging during combustion.

2. A method as described in claim 1 wherein the carrier is water.

3. A method as described in claim 2 wherein the coal fines/-water slurry has a ratio of coal fines to water ranging from about 50-50 to about 90-10, respectively.

4,518,394

WAX-IMPREGNATED FIRE KINDLING STICKS

Philip R. Templin, Oakmont, and Elizabeth L. Fareri, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 22, 1981, Ser. No. 333,304

Int. Cl.³ C10L *11/02, 11/06*

U.S. Cl. 44—38 **3 Claims**

1. A wax-impregnated fire kindling stick comprising a bonded cellulosic substrate having a density of at least about 16.0 pounds per cubic foot and impregnated with a normally solid hydrocarbon wax selected from paraffin wax, microcrystalline wax, and mixtures thereof and having a congealing point of at least about 155° F., said fire kindling stick having a burn time of at least about 15 minutes.

4,518,395

PROCESS FOR THE STABILIZATION OF METAL-CONTAINING HYDROCARBON FUEL COMPOSITIONS

Joseph Petronella, Old Bridge Township, Middlesex County, N.J., assignor to Nuodex Inc., Piscataway, N.J.

Filed Sep. 21, 1982, Ser. No. 420,667

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—53 **10 Claims**

1. A diesel fuel composition stabilized against oxidative deterioration that consists essentially of diesel fuel containing from 5 ppm to 500 ppm of copper and from 1% to 25% by volume of a stabilizer selected from the group consisting of alkanols having from 1 to 10 carbon atoms, glycols having from 2 to 9 carbon atoms, and mixtures thereof.

4,518,396

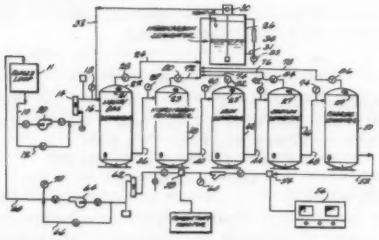
METHOD OF DEHYDRATING NATURAL GAS

William E. Rawson, Huntsville, Ala., assignor to Gas Conditioning Industries, Inc., Huntsville, Ala.

Filed Mar. 1, 1983, Ser. No. 471,157

Int. Cl.³ C10K *1/16*

U.S. Cl. 48—196 R **5 Claims**



1. A method of dehydrating natural gas, comprising:

(a) exposing said natural gas to a glycol of the formula

$$H—OCH_2—CH_2)_nOH$$

wherein n is 1–5;

(b) passing said glycol from said step (a) through a first strong acid cation exchange resin in the sodium ion form, a second strong cation exchange resin in the hydrogen ion form, and an anion exchange resin; and

(c) repeating said step (a) with said glycol obtained from said step (b).

4,518,397

ARTICLES CONTAINING NON-FUSED ALUMINUM OXIDE-BASED ABRASIVE MINERAL

Melvin A. Leitheiser, Stillwater, and Harold G. Sowman, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 311,381, Oct. 14, 1981, abandoned, Division of Ser. No. 145,383, May 13, 1980, Pat. No. 4,314,827, which is a continuation-in-part of Ser. No. 53,347, Jun. 29, 1979, abandoned. This application May 17, 1983, Ser. No. 495,179

Int. Cl.³ C04B *35/34*

U.S. Cl. 51—293 **18 Claims**

1. An abrasive article containing granular abrasive mineral comprising substantially calcium ion- and alkali metal ion-free, dense, non-fused synthetic, aluminum oxide-based granular abrasive mineral, comprising a secondary phase of randomly oriented crystallites comprising modifying component in a dominant continuous alumina phase comprising alpha-alumina, said modifying component, on a volume percent of fired solids of the mineral, being selected from:

(i) at least 10% of zirconia, hafnia, a combination of zirconia and hafnia, a combination of zirconia and samaria, or a combination of zirconia, hafnia and samaria;

(ii) at least 1% of a spinel derived from alumina and at least one oxide of a metal selected from cobalt, nickel, zinc, or magnesium, or a combination of said spinel with at least one of titania, ceria, or zirconia;

(iii) 1–45% of said zirconia, hafnia, or the combination of zirconia and hafnia and at least 1% of said spinel.

4,518,398

MANUFACTURING PROCESS FOR SINTERED CERAMIC BODY FOR CUTTING TOOLS

Hiroshi Tanaka, Gomyokuroji, Yatomi-cho, Ama-gun, Aichi-ken, and Yoshihiro Yamamoto, 14-402 Iwakuradanchi, Higashishinmachi Iwakura, Aichi-ken, both of Japan

Filed Jul. 18, 1980, Ser. No. 170,164

Claims priority, application Japan, Jul. 20, 1979, 54-92906

Int. Cl.³ B24D *3/16;* C04B *35/10, 35/52, 35/58*

U.S. Cl. 51—309 **21 Claims**

1. A manufacturing process of a sintered ceramic body for cutting tools comprising:

a step of preparing a mixture substantially consisting of 70–95% by volume of alumina and the balance of titanium nitride and one or more zirconium-containing components selected from the group consisting of zirconium, zirconium carbide and zirconium nitride, wherein the volumeric ratio of titanium nitride/zirconium-containing component(s) ranges between 95/5 and 50/50, inclusively, and

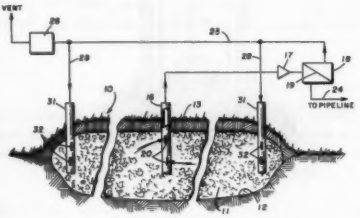
a step of sintering the mixture under the application of pressure, and under such conditions that the resulting body has a residual porosity not exceeding 0.2% by volume and a mean alumina crystal grain size not exceeding 2μ.

4,518,399

PROCESS FOR RECOVERING GASES FROM LANDFILLS

Henry Croskell, St. Louis, and Tommy E. Graham, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 24, 1984, Ser. No. 644,090
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—16 **3 Claims**



1. A process for recovering methane from a landfill, comprising

(a) providing at least one central well and a plurality of peripheral wells in the landfill,

(b) withdrawing a mixture of methane and carbon dioxide from said central well,

(c) separating the carbon dioxide from said mixture to provide a carbon dioxide enriched stream, and

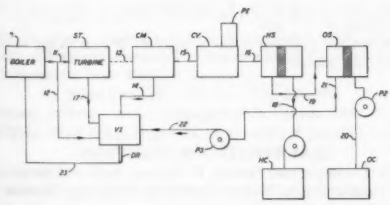
(d) applying a portion of the carbon dioxide enriched stream to said peripheral wells at a pressure of 7 kPa to 170 kPa.

4,518,400

STEAM-SIEVE METHOD AND APPARATUS

Gerald R. Newby, R.D. 2, Belden Hill, Harpursville, N.Y. 13787

Filed Jan. 6, 1984, Ser. No. 568,622
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—68 **9 Claims**



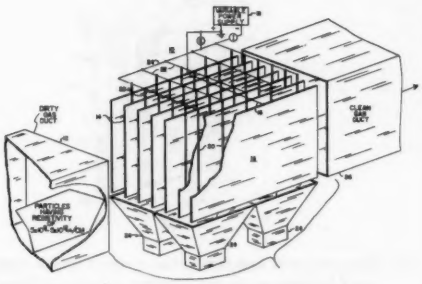
1. The method of producing hydrogen which comprises the steps of: compressing steam to provide a multi-component gas mixture; and applying the multi-component gas mixture to a first molecular sieve through which hydrogen may pass, but through which oxygen and steam will not pass.

4,518,401

ELECTROSTATIC PRECIPITATING SYSTEM

Duane H. Pontius, Birmingham, and Phillip V. Bush, Pinson, both of Ala., assignors to The United States of America as represented by the Environmental Protection Agency, Washington, D.C.

Filed Sep. 26, 1983, Ser. No. 535,643
Int. Cl.³ B03C *3/08*
U.S. Cl. 55—101 **3 Claims**



1. An electrostatic precipitating system comprising:

a source of gaseous field containing spaced particles, said particles having a resistivity of from 10^9 to 5×10^{12} ohm cm;

an electrostatic precipatating assembly having an inlet coupled to receive gaseous fluid from said source of gaseous fluid and an outlet, and comprising:

a plurality of parallel positioned plates having a spacing of from 9″ to 20″ and oriented wherein said gaseous fluid flows between said plates from said inlet to said outlet, and

a plurality of electrically conductive rods positioned in a plane equally spaced between each pair of plates, and rods having curved cross section regions facing plates of a radius of curvature not less than approximately 0.187″; and

a source of D.C. bias of from 20 to 50 kilovolts, the negative potential of which is connected to said rods, and the positive potential of which is connected to said plates of a potential providing an electrical field strength of from 0.5 to 3.5 kilovolts per cm and a current density of 0.5 to 10 nanoamperes per square cm;

whereby said gaseous field transisting from said inlet to said outlet are subjected to an electrical field between said rods and said plates, and corona discharge from said rods effects a negative charge on said particles in said gas, which said particles are then drawn to said plates and thereby removed from the gaseous fluid.

4,518,402

REUSEABLE AIR FILTER SYSTEM

Robert L. Dargel, 5430 NE. 16th Ave., Fort Lauderdale, Fla. 33334

Continuation of Ser. No. 320,161, Nov. 10, 1981, abandoned, which is a continuation of Ser. No. 114,702, Jan. 23, 1980, abandoned, which is a continuation of Ser. No. 959,007, Nov. 9, 1978, abandoned. This application Jun. 2, 1983, Ser. No. 500,319
Int. Cl.³ B03C *3/30;* **B01D** *46/52*
U.S. Cl. 55—103 **1 Claim**

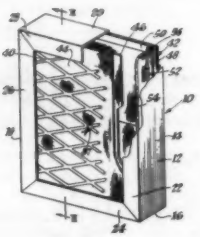
1. A filter system for filtering unwanted particles from a gas stream comprising:

at least three elements comprised of electrostatically self-charged filter material arranged in orderly adjacent successive stages for generating a self charge when gas flows through said at least three elements, said at least three elements including,

a first filter element of random spaced polypropylene positioned as the furthest said stage from where said gas stream enters said filter system;

a second filter element of random spaced polypropylene positioned as the closest stage where said gas stream enters said filter system;

a third filter element of random spaced polypropylene position between said first filter element and said second



filter element, said third filter element folded over on itself forming an air gap between adjacent surfaces for increasing filtering efficiency and, providing a means to bias said first filter element and said second filter element apart; and

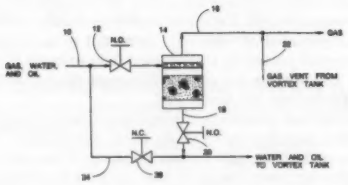
a generally U-shaped, non-corrosive edge side frame secured about the perimeter of said filter elements for maintaining said filter elements in axial alignment to the gas flow therethrough.

4,518,403

DEGASSER-DESURGER UNIT

Darryl W. Hertz, Casper, Wyo., assignor to The Standard Oil Company, Chicago, Ill.

Filed Oct. 28, 1983, Ser. No. 546,605
Int. Cl.³ F01D *19/00*
U.S. Cl. 55—194 **5 Claims**



1. A system for degassing and desurging a liquid stream, the liquid stream including water, gaseous components, and liquid hydrocarbon components, comprising:

a first conduit in communication at one end with a source of the liquid stream;

an enclosed vessel having a liquid inlet adjacent an upper portion thereof and in communication with a second end of the first conduit;

means for degassing and desurging the liquid stream consisting of a sparger device disposed within an upper portion of the enclosed vessel and in communication with the liquid inlet, the sparger device comprising a horizontal central conduit and a plurality of horizontal cross pipes connected to the central conduit, the central conduit and the cross pipes including a plurality of openings therein; and a body of packing elements retained within the enclosed vessel below the sparger device;

a second conduit connected at one end to a liquid outlet in the enclosed vessel below the bottom of the body of packing elements for removing the degassed and desurged water and liquid hydrocarbon components; and

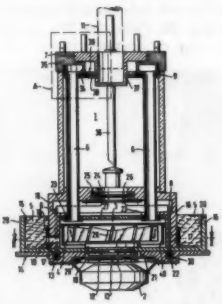
a third conduit connected to an opening in an upper portion of the enclosed vessel above the sparger device for removing separated gaseous components.

4,518,404

APPARATUS FOR GENERATING AN AEROSOL

Michael Vaillant, Kleppingstr. 9-11, D-4600 Dortmund, and Günter Klarhorst, Eisgrundstr. 7, D-4800 Bielefeld, both of Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,526
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 8222263[U]; Jun. 3, 1983, 8316307[U]
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—256 **20 Claims**



1. An apparatus for generating an aerosol, comprising:

(a) a housing for said apparatus;

(b) a motor mounted in said housing;

(c) an atomizing chamber for discharging and scattering the aerosol by means of an oscillation generator;

(d) an aerating wheel chamber separated from said atomizing chamber;

(e) an aerating wheel disposed in said aerating wheel chamber which passes drawn in air to the upper part of said atomizing chamber by means of conduits;

(f) a filter chamber disposed about the periphery of said aerating wheel chamber;

(g) a bacteria filter for filtering the air drawn in by said aerating wheel replaceably housed in said filter chamber; said atomizing chamber, said aerating wheel chamber and aerating wheel, and said filter chamber and bacteria filter being united in a modular unit releasably connected on the outer side of said housing;

(h) an air-tight and water-tight separating wall of said housing disposed between said motor and said aerating wheel;

(i) a magnetic coupling acting through said separating wall connecting said motor to said aerating wheel to drive said aerating wheel; and

(j) means for regulating the supply of drawn in air to said aerating wheel.

4,518,405

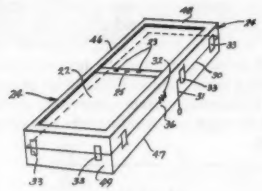
CLEAN ROOM WITH REPLACEABLE FILTER AND A SEAL CUTTING MECHANISM

Wendell J. Lough, and Donald E. Bishop, both of Hampstead, N.H., assignors to Weber Technical Products, Division of Craig Systems Corporation, Amesbury, Mass.

Filed Dec. 19, 1983, Ser. No. 562,421
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—385 A **11 Claims**

1. In a clean room having at least one filter panel with a filter frame therearound, a supporting frame within which the at least one filter panel is positioned and a cuttable seal filling the

peripheral area between the filter frame of said at least one filter panel and the support frame to prevent unfiltered air from short-circuiting therebetween, the improvement comprising an elongated, flexible cutting member having an end thereof fixedly secured to one of said filter frame and support frame on one side of said cuttable seal, said cutting member having



another end thereof exposed and free at the other side of said cuttable seal and having an intermediate length thereof positioned about the periphery of said filter frame on said one side of said cuttable seal whereby when said other end is pulled away from said filter frame said seal will be cut, permitting removal of said filter panel from said supporting frame.

4,518,406

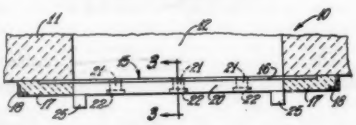
DRAIN BUSHING

Richard A. Perkins, Newark; William C. Brady, and Hellmut I. Glaser, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 6, 1983, Ser. No. 558,680

Int. Cl.³ C03B *37/08*

U.S. Cl. 65—1 **2 Claims**



1. A disposable, non-precious metal drain bushing for draining molten glass from a glass melting apparatus through an outlet opening, comprising an upper flat plate of a size and configuration to cover the outlet opening of the melting apparatus, a lower vertical rib on the undersurface of said plate, a pair of electrical contact ears on the undersurface of the rib and depending therefrom, and a plurality of vertical apertures through said plate and said rib, said apertures being counterbored at their lower ends to minimize flooding of molten glass onto the undersurface of the rib.

4,518,407

OPTICAL FIBRE PREFORM MANUFACTURE

Philip W. Black, Bishop's Stortford, and John Irven, Stansted, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,380

Claims priority, application United Kingdom, Mar. 7, 1979, 7908088

Int. Cl.³ C03P *37/025*; C03B *37/07*

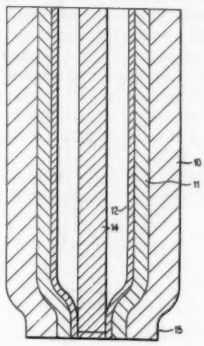
U.S. Cl. 65—3.12 **13 Claims**

1. A method of fabricating an optical fibre preform by utilizing a silica substrate tube having a first index of refraction comprising the steps of:

coating said tube with a first layer of silica including a dopant sufficient to provide a cladding layer exhibiting an index of refraction less than that of said silica tube,

coating said first layer with an inhibiting layer of substantially undoped silica to provide a barrier to prevent migration of said cladding layer dopant across said inhibiting layer,

inserting a substantially undoped silica rod coaxially into



said coated tube to provide a core of said optical fibre preform, and

fusing together said coated tube and said rod to form a solid cross-section optical fibre preform.

4,518,408

METHOD FOR PRODUCING GLASS FIBER

Mohinder S. Bhatti, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 14, 1983, Ser. No. 513,894

Int. Cl.³ C03B *37/085*

U.S. Cl. 65—6 **5 Claims**

1. In a method of making glass fibers comprising: supplying a stream of molten glass to a rotating rotor; discharging said glass through orifices in said rotor as a plurality of primary streams; and attenuating said primary streams into fibers comprising:

forming said rotor according to a method comprising:

forming a body having a circumferential wall, said body being comprised of a superalloy material,

forming orifices in said circumferential wall adapted to discharge molten glass therethrough,

subsequent to the formation of the orifices, hot isostatically pressing said body to reduce the diameter of the orifices and render the orifices more uniform sufficient to increase the uniformity of the diameters of the glass filaments produced therefrom as compared to an untreated rotor.

4,518,409

METHOD OF AND APPARATUS FOR MAKING A PARISON

Norbert Monden, Auetal, Fed. Rep. of Germany, assignor to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,159

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232288

Int. Cl.³ C03B *11/10*

U.S. Cl. 65—79 **12 Claims**

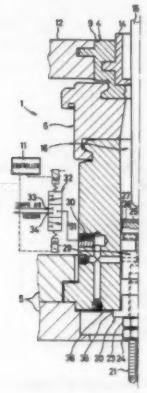
1. A method of making a parison from a gob of molten glass, the method comprising the steps of sequentially:

increasing the volume of the interior of a cup-shaped main mold body by an extra volume;

inserting the molten-glass gob through an upper opening into the volume-increased interior of the main mold body;

closing a split neck ring forming a neck mold at the opening above the main mold body on the main mold body so that the neck mold and the main mold body define a mold cavity partly formed by the interior of the main body;

inserting a plunger through the neck mold down into the gob in the mold cavity to displace the molten glass and shape the gob into a parison and decreasing to zero the



extra volume of the interior of the main mold body so that the molten glass rises in the mold cavity up above the main mold body; and

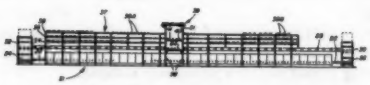
demolding the parison thus formed.

4,518,410

STORING BENDING MOLDS

Bernd Brockmueller, Hawkesbury, Canada, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 9, 1983, Ser. No. 492,854
Int. Cl.³ C03B *23/023*
U.S. Cl. 65—106 **9 Claims**



1. A method of storing molds for bending glass sheets to different patterns comprising establishing a series of vertically spaced, essentially horizontally extending conveyor means defining storage levels above the roof of a tunnel-type bending lehr having an essentially horizontally extending conveyor means for transporting glass sheet bending molds along a heating path extending through the length thereof, providing conveyor means at each of said levels including a return path at one of said levels for returning a set of molds to said heating path, providing elevator means to transfer selected molds of said molds between said return path and one or more of said other levels, transferring molds on said elevator means between said return path and one or more of said levels to store molds of one or more of said patterns at a selected one or more of said storage levels while transferring molds for one or more different patterns from a selected one or more of said storage levels to said return conveyor.

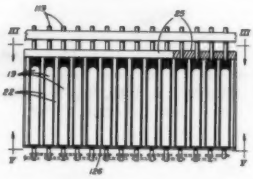
5. Apparatus for storing molds for bending glass sheets delivered along a circulating system comprising a path within a tunnel-type bending lehr extending in an essentially horizontal direction and a return path above said lehr, characterized by a series of vertically spaced, mold storage means extending lengthwise of said tunnel-type bending lehr in essentially horizontal planes at different levels to define storage levels above said lehr, platform means movable vertically between positions of alignment with said return path and selected of said storage levels and elevator means operatively connected to said platform means to move the latter vertically between a position aligned with said return path and a preselected position in alignment with any selected one of said storage levels, whereby said platform means, when empty and aligned with said return path, can be loaded with molds from said return path, can be moved to a position of alignment with any selected one of said storage levels, said molds unloaded from said loaded platform means onto said selected storage level, different molds can be loaded onto said platform means from any one of said storage levels, the loaded movable platform means can be aligned with said return path to unload said different molds onto said return path, and the process repeated until a new set of bending molds replaces the old set of bending molds from the mold circulating system comprising molds travelling along said path through said bending lehr and returning along said return path.

4,518,411

SHAPING GLASS SHEETS TO COMPLICATED SHAPES USING SPECIAL LIFT MOLD

Robert G. Frank, Murrysville; Michael T. Fecik, Pittsburgh, and George R. Claassen, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,057
Int. Cl.³ C03B *23/03*
U.S. Cl. 65—106 **13 Claims**



1. A method of shaping a sheet of heat deformable material to a shape including a sharply bent edge portion near a longitudinal edge thereof comprising:

heating said sheet to its deformation temperature; and

lifting said heat softened sheet by engaging portions of said sheet other than said longitudinal edge with transversely extending longitudinally spaced shaping members each having an upper surface that contacts said sheet in a transverse direction, while engaging said longitudinal edge with a continuous longitudinally extending elongated shaping member positioned adjacent to an end of each of said spaced shaping members and having an upper surface that fully contacts said longitudinal edge of said sheet along its entire length, wherein the contours is said spaced shaping members and said continuous elongated shaping member define the shape of said sheet.

6. An apparatus for shaping sheets of heat deformable material comprising:

a plurality of transversely extending longitudinally spaced shaping slats each having a longitudinal axis, the upper facing surface of said slats defining the transverse shape of said sheet to be shaped;

a continuous elongated end member have a longitudinal axis, the continuous upward facing surface of said end member defining the curvature of a longitudinal edge of said sheet to be shaped along its entire length;

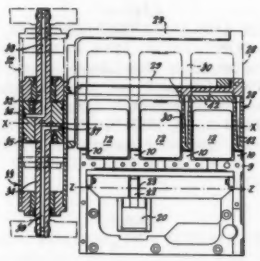
means for mounting said member adjacent to an end portion of each of said slats with the longitudinal axis of said slats generally parallel to one another and transverse to the longitudinal axis of said end member to provide a shaping device such that said upward facing surfaces of said slats and said end member form the desired contour of said sheet to be shaped; and

means to move said shaping device into engagement with said sheet to be shaped.

4,518,412
PARISON SCREENING IN A GLASSWARE FORMING MACHINE

David Braithwaite, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

PCT No. PCT/GB82/00055, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02875, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 22, 1982, Ser. No. 433,130
Claims priority, application United Kingdom, Feb. 27, 1981, 8106183
Int. Cl.³ C03B 9/38
U.S. Cl. 65—244 12 Claims



7. A glassware forming machine having three stations, namely a blank station at which a parison is formed from a gob of molten glass, an intermediate station at which the parison is allowed to reheat, and a blow station at which the parison is formed into an article of glassware, further comprising:

air screening means comprising a shroud assembly at said intermediate station, moveable beteen an open position, and a closed position in which the shroud assembly cooperates with stationary structure of the machine to substantially surround a parison and screen the parison from air drafts, said shroud assembly being provided with internal passages through which cooling water is passed during machine operation; and

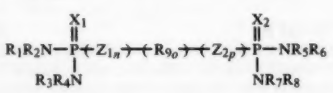
moving means to move the shroud assembly between its opened and closed positions at appropriate times in the cycle of operation of the machine.

4,518,413
POLY-PHOSPHORODIAMIDE UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

Michael D. Swerdloff, Parsippany; Jaroslav F. Kolc, Randolph; Milorad M. Rogic, Whippany, all of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 6, 1983, Ser. No. 501,673
Int. Cl.³ C05C 9/00
U.S. Cl. 71—28 32 Claims

1. A composition comprising an acceptable carrier a urease inhibiting effective amount of one or more polyphosphorodiamide compounds of the formula:



Wherein:

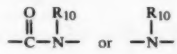
n, o and p are the same or different and are 0 or 1, with the proviso that at least one of n, o and p is 1;

X_1 and X_2 are the same or different and are oxygen or sulfur:

R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are the same or different and are hydrogen or alkyl having from 1 to about 4 carbon atoms;

R_9 is substituted or unsubstituted divalent aminophosphinyl, alkynylene, alkylene, alkenylene, cycloalkylene, cycloalkenylene, or arylene groups which groups may include one or more divalent oxygen, nitrogen, sulfur, sulfonyl, sulfinyl, or carbamyl functions, wherein permissible substituents include one or more amino, alkylamino, dialkylamino, arylamino, mercapto, alkylmercapto, S-diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, N-(diaminophosphinyl)carbamyl, halogen, hydroxy, sulfonic acid, alkyl, alkoxy, nitro or cyano groups;

Z_1 and Z_2 are the same or different and are divalent oxygen, sulfur, or a divalent carbamyl or amino moiety of the formula:



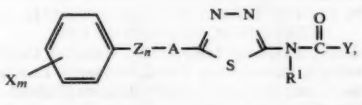
Wherein: R_{10} is hydrogen or substituted or unsubstituted cycloalkyl, alkyl, diaminophosphinyl, or phenyl wherein permissible substituents include one or more halogen, nitro, cyano, trifluoromethyl, alkoxy, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, N-(diaminophosphinyl)carbamyl, alkylmercapto, and mercapto groups or any two R_{10} substituents together may form an alkylene chain completing a 4, 5, 6, 7, or 8 membered ring structure.

4,518,414
THIADIAZOLE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Ulrich Schirmer, Heidelberg; Peter Plath, Ludwigshafen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1983, Ser. No. 457,186
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201861
Int. Cl.³ C07D 285/12; A01N 43/82
U.S. Cl. 71—90 11 Claims

1. A thiadiazole derivative of the formula



(I)

where R^1 is hydrogen or C_1–C_4-alkyl, A is an alkylene chain of 1 to 8 carbon atoms which is unsubstituted or substituted by C_1–C_4-alkyl, X is hydrogen, halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfonyl, C_3–C_6-cycloalkyl, phenyl, or unsubstituted or halogen-substituted aryloxy, m is 0, 1, 2, 3 or 4, Y is C_1–C_4-alkyl, C_3–C_6-cycloalkyl or NR^2R^3, where R^2 and R^3 independently of one another are each hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl, C_1–C_4-alkoxy or C_3–C_6-cycloalkyl, Z is oxygen or sulfur and n is 1, and where the radical

may be replaced by naphthyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy.

4,518,415
1-(TETRAHYDROFURYLMETHYL)AZOLES

Anthony F. Marchington, Reading; Timothy Lewis, Maidenhead; John M. Clough, Buckinghamshire; Paul A. Worthington, Maidenhead, and John Dalziel, Berkshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

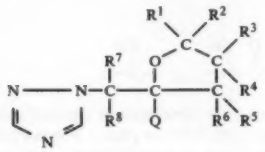
Filed Jan. 21, 1983, Ser. No. 459,966

Claims priority, application United Kingdom, Feb. 9, 1982, 8203707; Apr. 19, 1982, 8211290; May 11, 1982, 8213652; Nov. 2, 1982, 8231263

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *405/06;* **C07F** *1/00*

U.S. Cl. 71—92 **6 Claims**

1. A compound selected from the group consisting of compounds having the formula (I):



(Formula I)

and stereoisomers thereof, wherein Q is phenyl, halophenyl, C_{1-4} alkylphenyl, C_{1-4} alkoxyphenyl, halo C_{1-4} alkylphenyl, phenylphenyl or phenyl substituted with both halogen and C_{1-4} alkyl groups or phenyl substituted with both halogen and C_{1-4} alkoxy groups; and R^1 to R^6 and R^8, which may be the same or different are H or C_{1-4} alkyl and R^7 is H, C_{1-4} alkyl or phenyl; and acid addition salts and metal complexes thereof.

5. A method of regulating the growth of plants, which comprises applying to the plant, to seed of the plant, or to the locus of the plant or seed, an effective amount of a compound, as defined in claim 1.

6. A method of combating fungal diseases in a plant, which method comprises applying to the plant, to seed of the plant or to the locus of the plant or seed, an effective amount of a compound, as defined in claim 1.

4,518,416
CERTAIN TRIMETHYL SILYL-LOWER-ALKYL ESTERS OF PYRIDYLOXY-PHENOXY-LOWER ALKANOIC ACIDS, COMPOSITIONS CONTAINING SAME AND HERBICIDAL METHOD OF USE

Heinz Förster, Wuppertal; Erich Klauke, Odenthal; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

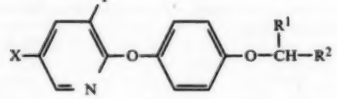
Filed May 18, 1983, Ser. No. 495,883

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221214; Jan. 4, 1983, 3300141

Int. Cl.[3] **C07D** *213/64;* **A01N** *43/40*

U.S. Cl. 71—94 **16 Claims**

1. A substituted pyridyl-phenyl ether of the formula



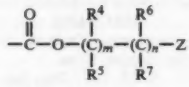
in which

X represents trifluoromethyl or chlorine,

Y represents hydrogen or chlorine,

R^1 represents hydrogen or methyl and

R^2 represents the radical of the formula



in which

R^4, R^5, R^6 and R^7 independently of one another represent hydrogen or alkyl with 1 to 4 carbon atoms,

m represents 1 or 2,

n represents 0 or 1 and

Z represents trimethylsilyl.

4,518,417
METHOD OF, AND ARRANGEMENT FOR, REDUCING OXIDE-CONTAINING FINE-PARTICLE ORES

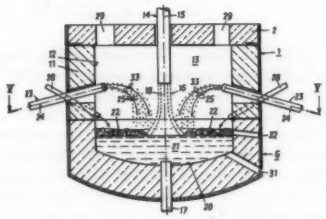
Walter Lugscheider, Linz; Alois Leutgöb, Steyr; Ernst Riegler, Enns, and Paul Müllner, Traun, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 5, 1983, Ser. No. 455,812

Claims priority, application Austria, Jan. 19, 1982, 167/82

Int. Cl.[3] **C21C** *5/52;* **C22B** *4/00*

U.S. Cl. 75—10 R **9 Claims**



1. In a method of reducing oxide-containing fine-particles ores to be carried out in a rotationally symmetric melting vessel provided with plasma-jet generating plasma burning means, side walls and charging openings, by melting and reducing the oxide-containing ore particles in the presence of at least one of solid, liquid and gaseous carbon carriers by action, the improvement comprising at least a portion of the oxide-containing ore particles to be reduced being introduced laterally through said charging openings provided in said side walls and being set in a cyclonic rotational movement to produce a rotating particle stream, and wherein the plasma jet of said plasma burner means is generated along a substantially vertical axis of said melting vessel and surrounded by said rotating particle stream.

4,518,418
ELECTRON BEAM REFINEMENT OF METALS, PARTICULARLY COPPER

Archibald W. Fletcher, Tucson, Ariz., and Charles d'A. Hunt, Occidental, Calif., assignors to Duval Corporation, Houston, Tex.

Filed Jun. 10, 1983, Ser. No. 503,376

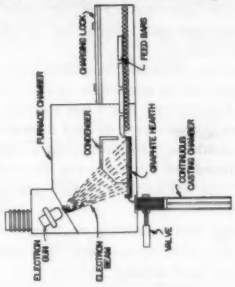
Int. Cl.[3] **C22B** *4/00*

U.S. Cl. 75—10 R **31 Claims**

1. A method of refining copper metal which contains at least 35 ppm in total of selenium, tellurium, sulfur, bismuth and lead impurities and at least 20 ppm of silver impurity, which impurities are capable of forming intermetallic species with copper atoms, with each other or with other impurities in the copper metal,

comprising passing the copper metal across a hearth in a vacuum effective to enable electron beam operation and irradiating the metal with an electron beam of sufficient

strength and duration to heat the metal and volatilize a portion thereof, whereby, in the remaining copper metal,



the total content of selenium, tellurium, sulfur, bismuth and lead is reduced to less than about 20 ppm and the silver content is reduced to less than about 16 ppm.

4,518,419

METHOD OF CARRYING OUT METALLURGICAL OR CHEMICAL PROCESSES IN A SHAFT FURNACE, AND A LOW SHAFT FURNACE THEREFOR

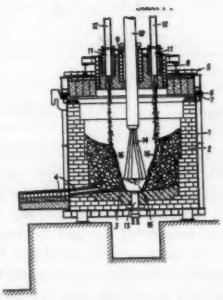
Walter Lugscheider, Linz; Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, all of Austria, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany and Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 20, 1983, Ser. No. 563,308

Claims priority, application Austria, Dec. 22, 1982, 4638/82; Oct. 28, 1983, 3833/83

Int. Cl.³ C21C *5/52*

U.S. Cl. 75—11 **17 Claims**



1. In a method of carrying out metallurgical processes, chemical processes and the like in a shaft furnace having an upper cover, an inner wall and a bottom, by supplying electric energy of a plasma burner means penetrating said upper cover, the improvement comprising

forming a plasma torch region in said shaft furnace by forming a plasma torch between an electrode penetrating said upper cover at about its center and a counter-electrode penetrating said bottom of said shaft furnace,

introducing charging stock concentrically about said plasma torch so as to form a protective wall, having an inner side, of solid charging stock components piled up on said bottom of said furnace at said inner wall of said furnace and surrounding said plasma torch region, and

processing said solid charging stock from said inner side of said protective wall which is exposed to said plasma torch region.

4,518,420

WINNING METAL FROM ORE

Michael Cox, Hitchin; Michael J. Gray, Luton, and Phillip W. Duke, Chester, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 19, 1984, Ser. No. 572,148

Claims priority, application United Kingdom, Jan. 21, 1983, 8301647

Int. Cl.³ C22B *1/10*

U.S. Cl. 75—26 **17 Claims**

1. A process of winning one or more desired metals from an ore containing also at least one undesired metal, comprising the steps of:

treating the ore with a polydentate reagent displaying a substantial stereochemical constraint on a metal, which reagent forms a volatile compound with the or each desired metal but not with the undesired metal(s);

transporting the compound in the vapor phase from the vicinity of the ore; and

decomposing the compound to literate elemental metal.

4,518,421

PROCESS FOR PRODUCING SOLID METAL PARTICLES FROM A BATH OF METAL

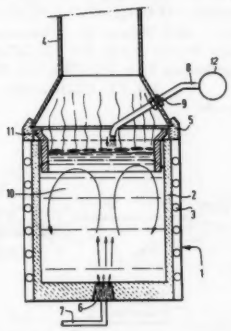
Jean Foulard, Ablon; Jean F. Rimbert, Igny; Gilles Vernet, Paris, and Albert-Gilbert Goursat, Voisins-le-Bretonneux, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 1, 1984, Ser. No. 605,779

Claims priority, application France, May 4, 1983, 83 07415

Int. Cl.³ C21C *7/10*

U.S. Cl. 75—49 **16 Claims**



1. A process for selectively refining molten metal contained in a closed treatment container to remove an impurity from said metal, said process comprising

heating a metal to be refined in said container to a temperature sufficient to melt the metal to form a bath of the molten metal and sufficient to vaporize the impurity from an upper surface of the bath of molten metal;

bringing a cryogenic material into close contact with the upper surface of said bath of molten metal so that the cryogenic material vaporizes against said surface by calefaction to form a gaseous layer atop said surface; with the vapor of said cryogenic material contacting vapor of said impurity and condensing the same to form impurity particles entrained within said gaseous layer; and

removing from said container the impurity particles entrained in the vapor of said cryogenic material.

4,518,422
PROCESS AND APPARATUS FOR REFINING STEEL IN A METALLURGICAL VESSEL

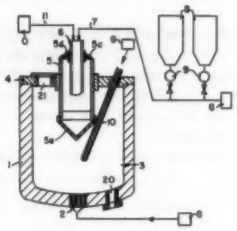
Paul Metz, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Nov. 16, 1983, Ser. No. 552,413

Claims priority, application Luxembourg, Nov. 17, 1982, 84472

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—58 **41 Claims**



1. A process for refining steel in a metallurgical vessel having a metal melt therein, said melt having a first slag thereon, including the steps of:

delivering a combustible material to a working zone at an impact point at the surface of said melt;

delivering oxygen to said working zone at said impact point whereby a highly reactive second slag is produced therein; and

mixing said melt whereby heat is evenly distributed therethrough.

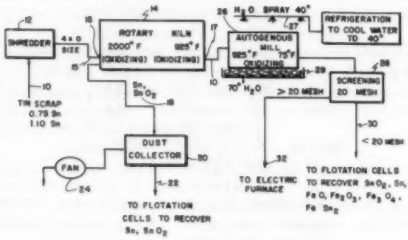
4,518,423
METHOD FOR PREPARING A LOW RESIDUAL ALLOY STEEL CHARGE FROM SCRAP METAL

Carl J. Herter, 1638 Walnut St., Allentown, Pa. 18102

Continuation-in-part of Ser. No. 529,290, Sep. 6, 1983. This application Mar. 15, 1984, Ser. No. 590,028

Int. Cl.³ C22B *25/06*

U.S. Cl. 75—64 **13 Claims**


SHREDDER
4 x 0 SIZE
ROTARY KILN 2000° F (REDUCING) (OXIDIZING)
AUTOGENOUS MILL 885° F 75° F OXIDIZING
REFRIGERATION TO COOL WATER TO 40°
SCREENING 20 MESH
TIN SCRAP 0.75 Sn 1.10 Sn
DUST COLLECTOR
FAN
TO FLOTATION CELLS TO RECOVER Sn, SnO2
TO ELECTRIC FURNACE
TO FLOTATION CELLS TO RECOVER SnO2, Sn, Fe O, Fe2O3, Fe3O4, Fe Sn2
H2O SPRAY 40°
70° H2O
> 20 MESH
< 20 MESH

1. A method of preparing a low residual alloy for a steel charge from a tin coated, iron based metal comprising:

(a) introducing tin scraps into a feed end of a kiln wherein said kiln includes temperature and atmospheric zones, said kiln's feed end having an oxidizing atmosphere and a beginning feed end temperature of not less than 2000 degrees F. and maintaining said kiln's feed end zone temperature at not less than about 1650 degrees F. to convert at least part of any iron-tin alloy present into its epsilon phase and, thereby, additionally producing an oxide laden dust of mixed tin, tin oxide and iron;

(b) advancing said feed through said kiln from said feed end to approximate said kiln's midsection, wherein said kiln's midsection temperature is not less than about 1400 degrees F. to further convert part of said iron-tin alloy into the zeta phase and, thereby, additionally producing an additional oxide laden dust of tin, tin oxide and iron;

(c) removing said oxide laden dust of part (a) and part (b) from said kiln;

(d) still further advancing said feed through said kiln from said midsection to said kiln's exit end wherein said kiln's exit end temperature is not less than about 900 degrees F. to further convert part of said iron-tin alloy into its eta phase and additionally producing a metallic scale formation composed of variously tin, tin oxide, iron tin alloy, iron, ferrous oxide, ferric oxide and magnetite on said feed; and,

(e) separating and removing said scale from said feed to leave a low alloy scrap metal feed suitable for use as a charge in a steel making furnace.

4,518,424
METAL SCRAP RECLAMATION SYSTEM

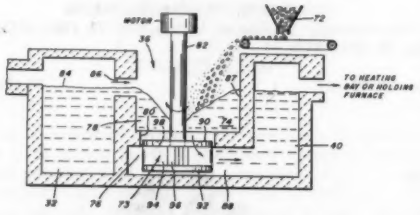
Robert J. Ormesher, Allegheny Township, Westmoreland County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 573,115, Jan. 23, 1984, Pat. No. 4,486,228, which is a continuation of Ser. No. 475,310, Mar. 14, 1983, abandoned. This application Feb. 6, 1984, Ser. No. 577,258

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.³ C22B *21/00*

U.S. Cl. 75—65 R **31 Claims**



1. A recirculating system for ingestion of metal scrap into a molten melting media comprising:

(a) a heating bay containing the molten melting media;

(b) a scrap charging bay having upper and lower portions wherein metal scrap is charged into the upper portions of the bay and ingested into said melting media, the scrap charging bay connected to said heating bay to permit molten melting media to be circulated from the heating bay through the scrap charging bay and back to the heating bay; and

(c) an impeller positioned in the scrap charging bay for purposes of ingesting said metal scrap into the molten metal media;

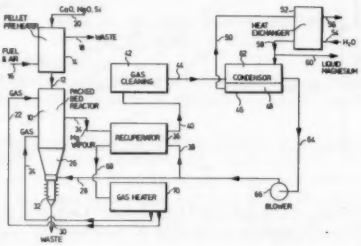
(i) the impeller having a top member and spaced therefrom a base member, the top member provided with an opening therein, said impeller having blades positioned between said top member and base member, the blades extending in a generally radial direction,

(ii) the impeller adapted to draw scrap values and melting media through the opening in said top member in a downward direction on rotation thereof and to propel said scrap values and melting media therefrom in a generally radial direction by use of said blades, the impeller positioned so as to move the scrap values and melting media from said upper portions through said impeller and out into lower portions of the charging bay.

4,518,425
PRODUCTION OF MAGNESIUM METAL

John R. Wynnyckyj, Kitchener, Canada, assignor to University of Waterloo, Waterloo, Canada

Filed Dec. 20, 1983, Ser. No. 563,555
Int. Cl.[3] C22B *26/22*
U.S. Cl. 75—67 R 17 Claims



1. A method for the production of magnesium, which comprises:

forming a solid feed of magnesium oxide, calcium oxide and silicon and preheating said feed to a temperature of about 750° C. to about 1100° C.,

forwarding said feed to a packed bed reactor having internal walls resistant to the activity of the reactants therein,

preheating an inert gas stream to a temperature sufficient to sustain the reaction temperature in said reactor,

feeding said preheated inert gas steam to said reactor in the form of a split stream such that a first portion having a temperature of about 1300° to about 1600° C. flows cocurrently with the solid feed in the reactor and a second portion having a temperature of about 1200° to about 1400° C. flows countercurrently to the solid feed in the reactor,

reacting the components of the solid feed in the packed bed reactor in accordance with the equation:

$$2CaO+2MgO+Si \rightarrow 2Mg+Ca_2SiO_4$$

at a temperature of about 1050° to about 1350° C. in the presence of the gas stream,

removing a gaseous product stream from the packed bed reactor containing about 1.0 to about 8.0% by volume of magnesium vapour in the inert gas, and

discharging by-product solids from the packed bed reactor.

4,518,426
PROCESS FOR ELECTROLYTIC RECOVERY OF TITANIUM METAL SPONGE FROM ITS ORE

Andrew H. Murphy, Naples, Fla., assignor to Metals Production Research, Inc., Media, Pa.

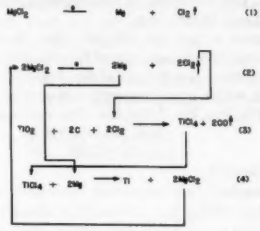
Division of Ser. No. 483,502, Apr. 11, 1983, Pat. No. 4,487,677. This application May 9, 1984, Ser. No. 608,433
Int. Cl.[3] C22B *34/12;* C01G *23/02;* C25C *3/28/3/04*
U.S. Cl. 75—112 10 Claims

1. A process for producing titanium metal sponge in a stepwise operation within a closed cell system comprising the steps of:

A. electrolytically decomposing molten magnesium chloride into magnesium metal and chlorine gas within a closed cell to form said magnesium metal as a molten layer upon said magnesium chloride;

B. terminating said electrolytic decomposition, and subsequently;

C. directly contacting titanium tetrachloride with said layer of magnesium metal for effecting a reduction reaction therebetween within the same closed cell to form titanium metal sponge and magnesium chloride; and

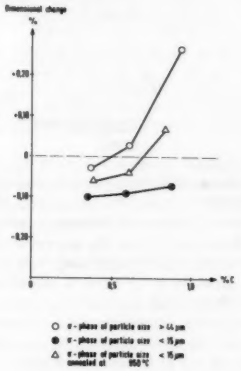


D. removing said titanium metal sponge from said closed cell.

4,518,427
IRON OR STEEL POWDER, A PROCESS FOR ITS MANUFACTURE AND PRESS-SINTERED PRODUCTS MADE THEREFROM

Jan R. Tengzelius, Viken; Carl-Axel Blände, and Lars-Erik Svensson, both of Höganäs, all of Sweden, assignors to Höganäs AB, Höganäs, Sweden

Filed Oct. 26, 1982, Ser. No. 436,798
Claims priority, application Sweden, Nov. 11, 1981, 8106711
Int. Cl.[3] B22F *1/00*
U.S. Cl. 75—251 4 Claims



1. Chromium-containing iron or steel powder suitable for compressing and sintering to form a substantially homogeneous article having good strength and dimensional stability properties comprising a mixture of iron powder and a chromium-containing powder and containing about 0.2–15% by weight of chromium, the rest being iron with usual accessorial elements, optionally together with other conventional alloying elements of alloyed powders, characterized thereby that the chromium is present in the form of a pulverulent Fe-Cr-alloy in α-phase which contains about 40–50% by weight of Cr and has a particle size essentially lower than about 44 μm.

4,518,428
AGGLOMERATES CONTAINING OLIVINE

Frank H. Ellenbaum, Willowbrook, Ill., and Richard Ciesco, Griffith, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Continuation of Ser. No. 359,545, Mar. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 090,538, Nov. 2, 1979, abandoned, which is a division of Ser. No. 652,549, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 493,696, Aug. 1, 1974, Pat. No. 3,966,456. This application Mar. 7, 1984, Ser. No. 586,929

Int. Cl.³ C21B *5/04*

U.S. Cl. 75—257 **12 Claims**

1. An agglomerate consisting essentially of finely divided iron ore and olivine in an amount of about 0.5% to 10% and characterized by (a) a size distribution wherein 97.1% or more of the pellets are retained by a ½" screen, (b) greater resistance to disintegration as measured by 2.64% of fines or less resulting from handling, (c) a bulk density of 132.5 lb/ft³ or less, and (d) a porosity of 25.22% or more of voids.

4,518,429
CORROSION INHIBITING PAINT COMPOSITION

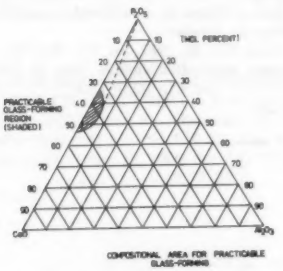
Cyril F. Drake, Harlow; Alan Maries, London, and Paul F. Bateson, Duxford, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Division of Ser. No. 251,020, Apr. 3, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 516,664

Claims priority, application United Kingdom, Apr. 8, 1980, 8011297

Int. Cl.³ C09D *5/08*

U.S. Cl. 106—14.39 **8 Claims**



1. In a corrosion inhibiting paint formulation adapted to protect a metal surface to which it is applied, said formulation comprising a resin binder vehicle and a corrosion inhibiting glass powder dispersed therein; the improvement comprising, as said glass powder, a glass comprising from 32 to 54 mole % calcium oxide, from 46 to 68 mole % phosphorus pentoxide and a glass modifying oxide selected from the group consisting of alumina, magnesia, strontium oxide, barium oxide, zinc oxide, ferric oxide, an alkali metal oxide and mixtures thereof, the composition of the glass being such that it releases corrosion inhibiting ions when in contact with water.

4,518,430
DENTAL RESPTORATIVE CEMENT PASTES

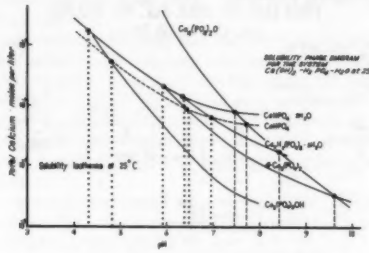
Walter E. Brown, Rockville, and Laurence C. Chow, Germantown, both of Md., assignors to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 373,157, Apr. 29, 1982,. This application Oct. 6, 1983, Ser. No. 539,740

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—35 **13 Claims**

1. A dental restorative paste comprising an aqueous mixture of $Ca_4(PO_4)O$ and at least one other calcium phosphate selected from the group consisting of $CaHPO_4.2H_2O$, $CaHPO_4$,



$Ca_8H_2(PO_4)_6.5H_2O$, α-$Ca_3(PO_4)_2$, β-$Ca_3(PO_4)_2$, and modified $Ca_3(PO_4)_2$, the paste being capable of hardening into a cement.

4,518,431
LIGHT WEIGHT INSULATING BUILDING BLOCKS AND METHOD OF MAKING SAME

Henry A. Duvier, Jr., 1912 Shamrock Dr., Brentwood, Tenn. 37027

Filed Aug. 10, 1984, Ser. No. 639,475

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—97 **19 Claims**

1. An agglomerated particulate for use in manufacturing light weight structural building blocks having high thermal resistance, comprising expanded ceramic aggregates and cement in the ratio of approximately 24 parts of ceramic aggregates to 1 part of cement by volume in an agglomeration admixed with water and cured in air for at least 24 hours, the surface of said ceramic aggregates being coated with and encased in the cement without adhesion of the ceramic particles.

4,518,432
SLAG BRIQUETTE

Dennis R. Hess, Anoka, Minn., and Arthur Antilla, Katy, Tex., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Jan. 20, 1983, Ser. No. 459,550

Int. Cl.³ C04B *7/14*

U.S. Cl. 106—117 **6 Claims**

1. A slag briquet comprising:

(a) from 1 part to about 5 parts by weight of a starch; and

(b) from about 50 parts to about 100 parts by weight slag.

4,518,433
ENTERIC COATING FOR PHARMACEUTICAL DOSAGE FORMS

Emanuel J. McGinley, Morrisville, and Domingo C. Tuason, Jr., Bensalem, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 8, 1982, Ser. No. 440,118

Int. Cl.³ C08L *1/08;* **C08G** *18/10*

U.S. Cl. 106—180 **22 Claims**

1. A process of making a polymeric powder which is readily dispersible in water to provide a composition useful for forming an enteric coating on pharmaceutical dosage forms, comprising providing a freshly prepared aqueous dispersion of a water-insoluble enteric polymer, adding to said dispersion an acetylated monoglyceride characterized by being liquid at room temperature and having a degree of acetylation of at least about 96%, said acetylated monoglyceride being added in an amount of between about 6% and about 18% based upon the weight of the dry insoluble solids contained in the dispersion, thoroughly mixing to distribute the acetylated monoglyceride

throughout the dispersion, and homogenizing and spray drying to form the powder.

4,518,434

CARBON BLACK AND PROCESS FOR PREPARING SAME

Charles R. Wilder, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1983, Ser. No. 518,556

Int. Cl.³ C09C *1/48, 1/58*

U.S. Cl. 106—307 **8 Claims**

1. A process which reduces the surface area of carbon black and increases the structure, said process consisting essentially of

mixing from about 1 to about 30 parts by weight of an organic peroxide represented by the formula R—O—O—R′ wherein R and R′ comprises hydrogen and carbon and can be the same or different and each R and R′ contains from 1 to about 16 carbon atoms with each 100 parts by weight of a carbon black formed in an oil furnace process and characterized by a surface area in the range of 20–200 m^2/g, a DBP structure in the range of 20–200 cm^3/g and a pH in the range of 5–10 to form a treatment mixture; and

heating the treatment mixture.

4,518,435

DISPERSING AGENT FOR SOLIDS IN POLAR ORGANIC LIQUIDS

James F. Stansfield; James Toole, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 276,517, Jun. 23, 1981, Pat. No. 4,398,955, which is a continuation-in-part of Ser. No. 180,810, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 877,390, Feb. 13, 1978, abandoned. This application Jan. 18, 1983, Ser. No. 459,036

Claims priority, application United Kingdom, Feb. 21, 1977, 718577

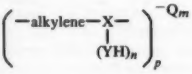
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ C09B *47/04;* **C09D** *11/00*

U.S. Cl. 106—308 N **10 Claims**

1. A dispersion of from 10% to 80% by weight, based on the total weight of the dispersion, of a particulate solid selected from organic pigments, organic disperse dyestuffs and carbon black in a polar organic liquid selected from ethers, esters, ketones, glycols, alcohols and amides, said dispersion containing from 2% to 50% by weight, based on the weight of the particulate solid, of a salt of an amine of the formula:

wherein each of A, B and D independently represents alkyl, -YH or



wherein

each X independently represents an oxygen or a nitrogen atom provided that,

where X is oxygen, m+n=1 and p=1, and

where X is nitrogen, m+n=2 and p is from 1 to 30;

each Q independently represents alkyl or —YH; and

each Y independently represents a poly(lower alkylene oxy) chain containing from 3 to 50 lower alkylene oxy groups, provided that

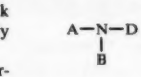
(i) at least one of A, B and D contains a poly(lower alkylene oxy) chain,

(ii) at least 50% of the lower alkylene groups in each poly(lower alkylene oxy) chain are propylene, and

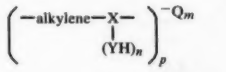
(iii) not more than one of the alkylene or alkyl groups contains more than 8 carbon atoms,

with an aromatic acid having at least two benzene rings selected from an organic pigment containing one or more acid groups and an organic dyestuff containing one or more acid groups.

10. A salt of an amine of the formula:



wherein each of A, B and D independently represents alkyl, -YH or



wherein

each X independently represents an oxygen or a nitrogen atom provided that,

where X is oxygen, m+n=1 and p=1, and

where X is nitrogen, m+n=2 and p is from 1 to 30;

each Q independently represents alkyl or —YH; and

each Y independently represents a poly(lower alkylene oxy) chain containing from 3 to 50 lower alkylene oxy groups provided that,

(i) at least one of A, B and D contains a poly(lower alkylene oxy) chain,

(ii) at least 50% of the lower alkylene groups in each poly(lower alkylene oxy) chain are propylene, and

(iii) not more than one of the alkylene or alkyl groups contains more than 8 carbon atoms,

with an aromatic acid having at least two benzene rings selected from an organic pigment containing one or more acid groups and an organic dyestuff containing one or more acid groups.

4,518,436

PROCESS FOR THE PRODUCTION OF GRAFT CRYSTALS FOR USE IN SEEDING SUGAR BOILING BRINES

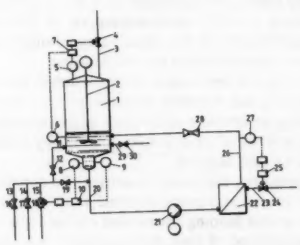
Pieter W. van der Poel, Prinsenbeek, Netherlands, assignor to CSM Suiker B.V., Amsterdam, Netherlands

Filed Sep. 13, 1983, Ser. No. 531,926

Claims priority, application European Pat. Off., Sep. 23, 1982, 82201191.2

Int. Cl.³ C13F *1/02*

U.S. Cl. 127—60 **2 Claims**



1. A process for the production of graft crystals for use in seeding sugar boiling brines which comprises

(a) adding an isopropanol suspension of milled sugar having a grain size of 5–20 micrometers to a concentrated sugar solution having a supersaturation number of 1.12–1.20 in a crystallizer, the suspension being added in a volume which is 1.8–2.2% of the total volume of the resultant mixture,

(b) homogenizing the mixture by means of a circulation pump,

(c) controlling crystallization to form graft crystals having a grain size of about 200 micrometers by lowering the pressure in the crystallizer to 60–80 centibars to cause evaporation of liquid, which evaporation lowers the temperature of the mixture to 75°–100° C., and

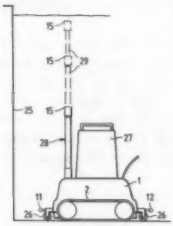
(d) adjusting the pressure and temperature to maintain a supersaturation number of 1.12–1.20.

4,518,437

METHOD AND APPARATUS FOR CLEANING A WATER TANK

Peter Sommer, Villnachern, Switzerland, assignor to Sommer, Schenk AG, Switzerland

Filed Jul. 5, 1983, Ser. No. 511,010
Claims priority, application Switzerland, Jul. 5, 1982, 4085/82
Int. Cl.³ B08B 9/08; E04H 3/20
U.S. Cl. 134—18 **7 Claims**



1. A method of controlling an underwater cleaning apparatus for cleaning the interior of a water tank, the cleaning apparatus being of the type including a housing carrying cleaning means and reversible and steerable means for propelling the housing across a tank surface, comprising the steps of:

establishing a sequence of courses defining a path of travel for the apparatus to follow repeatedly traverse the surface such that all of the surface will be traversed and cleaned in a systematic fashion,

initially setting the apparatus on a first course,

producing a signal representatative of the actual course being traveled by the cleaning apparatus by actual travel sensor means carried by said housing,

comparing the first course with the actual course signal and adjusting the steerable means to correct deviations,

detecting an obstacle in the path of the apparatus and causing reversal of its direction of travel by limit sensors carried by said housing,

after detecting the obstacle, setting the apparatus on a second course at a predetermined angle relative to the first course and holding the second course for a first predetermined period of time, and

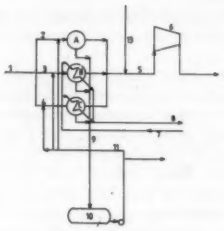
after traveling along the second course for the first predetermined time period, directing the apparatus along a third course parallel with the first course.

4,518,438

METHOD OF TRANSPORT, COOLING AND COMPRESSION OF NITROGEN OXIDE-CONTAINING GASES

Harald Storen, Olso, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Aug. 3, 1983, Ser. No. 519,813
Claims priority, application Norway, Aug. 6, 1982, 822688
Int. Cl.³ B08B 9/00
U.S. Cl. 134—22.1 **2 Claims**



1. In a method for removing and preventing the formation of salt deposits in critical sections of a process plant in which hot nitrogen oxide-containing gas is transported, cooled, dried by removal of condensate and compressed, and wherein said gas at said critical sections is maintained at a desired water vapor pressure in excess of the equilibrium water vapor pressure of the salt deposits at the temperatures existing in the critical sections, the improvement wherein said desired water vapor pressure is maintained by:

dividing said hot gas into at least two separate streams of hot gas;

solely cooling at least one said stream by injecting directly thereinto water in liquid form in an amount which by evaporation into said hot gas is sufficient to achieve said desired water vapor pressure;

cooling the remaining said streams by indirect cooling, forming condensate; and

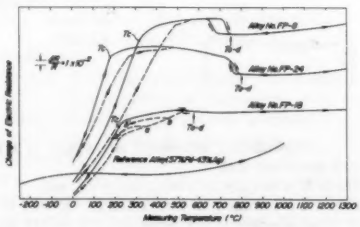
joining the thus directly and indirectly cooled said streams prior to introduction thereof into said critical sections.

4,518,439

ALLOY WITH SMALL CHANGE OF ELECTRIC RESISTANCE OVER WIDE TEMPERATURE RANGE AND METHOD OF PRODUCING THE SAME

Hakaru Masumoto, and Naoji Nakamura, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Filed Oct. 29, 1982, Ser. No. 437,613
Claims priority, application Japan, Dec. 14, 1981, 56-200065
Int. Cl.³ C22C 5/04
U.S. Cl. 148—3 **13 Claims**



3. A method of producing an electric resistive element, comprising the steps of melting an alloy consisting essentially

of 59.0–88.0 wt.% of palladium and the remainder of iron, molding the melt of said alloy into a mold, quenching the molded alloy from a temperature higher than the order-disorder transformation point thereof but lower than the melting point thereof to room temperature, applying heat-resisting insulating material onto the surface of the quenched alloy, cold working the insulated alloy into a desired form for shaping, and annealing the shaped alloy by heating in a non-oxidizing atmosphere at a temperature higher than the order-disorder transformation point thereof but lower than the melting point thereof for a duration longer than 2 seconds but shorter than 100 hours and cooling at a rate of 5° ∝ 300° C./hour, whereby said alloy has a temperature coefficient of electric resistance with an absolute value smaller than 50 ppm/°C. over a temperature range of 570° C. to 1335° C.

4,518,440

METHOD FOR PASSIVATING STAINLESS STEEL SURFACES AND PRODUCT THEREOF

William L. Phillips, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1984, Ser. No. 598,930
Int. Cl.³ C23F *7/04*
U.S. Cl. 148—6.14 R **6 Claims**

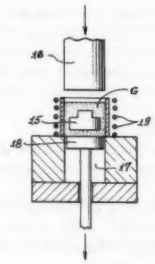
1. A method for treating the surface of a stainless steel object comprising in sequence heating said object in an oxidative atmosphere to a temperature of from about 400° F. to about 1250° F. to form a coating of magnetite on said surface, treating said surface with a dilute mineral acid solution and forming a coating of ferric oxide on said surface having a chromium to iron ratio of from about 0.5 to about 8.0.

4,518,441

METHOD OF PRODUCING METAL ALLOYS WITH HIGH MODULUS OF ELASTICITY

Robert W. Hailey, 2030-229 Beverly Plz., Long Beach, Calif. 90815

Filed Mar. 2, 1984, Ser. No. 585,400
Int. Cl.³ B22F *3/14*
U.S. Cl. 148—11.5 P **9 Claims**



1. A method for producing metal alloys with improved properties such a substantially increased moduli of elasticity, that includes

(a) mixing fine metal and non-metal powders to provide an alloy mix, with the major alloying constituent by weight selected from the group that consists essentially of iron, cobalt and nickel, and with the non-metal minor alloying constituent selected from the group that consists essentially of carbon, boron and silicon,

(b) milling said mix in a controlled atmosphere to a homogeneous condition that provides the desired breakdown, distribution and alloying characteristics of the powders, as well as desired handling and pressing characteristics,

(c) forming the mix to a preliminary powder shape, said forming including exerting pressure on the mix,

(d) and heating and transferring said powder shape to a hot refractory particle matrix and pressurizing said matrix so as to consolidate and densify the powder shape and to diffusion bond the powders to a solid body,

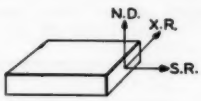
(e) whereby the body may be subjected to a subsequent heat treatment serving to develop the uniformity, the grain structure, and the properties required in the alloy body.

4,518,442

METHOD OF PRODUCING COLUMNAR CRYSTAL SUPERALLOY MATERIAL WITH CONTROLLED ORIENTATION AND PRODUCT

Herbert A. Chin, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,248
Int. Cl.³ C22F *1/10*; C22C *19/03*
U.S. Cl. 148—11.5 N **9 Claims**



4. A method for producing nickel superalloy sheet comprised of aligned, elongated grains whose axis of elongation corresponds essentially to the <110> direction including the steps of

a. providing a textured nickel superalloy sheet having a {110} <112> sheet texture with the <112> axis corresponding essentially to the (straight) rolling direction

b. passing the sheet through a thermal gradient, whose hot end exceeds the recrystallization temperature of the alloy in the straight rolling direction, so as to effect directional recrystallization

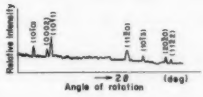
whereby the resultant sheet will contain elongated grains whose axis of elongation is a first <110> direction with a second <110> direction being parallel to the cross rolling direction and a <100> direction being normal to the sheet, said first <110> direction, said second <110> direction and said <100> direction being orthogonal.

4,518,443

ACOUSTIC DIAPHRAGM

Shinichi Yokozeki; Masami Kimura, and Tsunehiro Tsukagoshi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,534
Claims priority, application Japan, May 25, 1982, 57-87214
Int. Cl.³ G10K *13/00*
U.S. Cl. 148—400 **1 Claim**



1. An accoustic diaphragm having a surface, and being formed of a material selected from the group consisting of beryllium, or an alloy consisting of at least 85% by weight of beryllium with the rest consisting of aluminium, copper, zinc

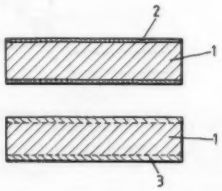
titanium and/or silver, said diaphragm having a crystal structure such that only the plane (11$\bar{2}$0) thereof is oriented parallel to the surface of the diaphragm.

4,518,444

MATERIAL WHICH IS AT LEAST PARTIALLY MADE FROM A CONSTITUENT HAVING A ONE-WAY SHAPE MEMORY EFFECT AND PROCESS TO PRODUCE SAID MATERIAL

Joachim Albrecht, Mülligen, and Thomas Duerig, Nussbaumen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 27, 1982, Ser. No. 402,274
Claims priority, application Switzerland, Feb. 5, 1982, 706/82
Int. Cl.³ C23C *9/00*
U.S. Cl. 148—402 **15 Claims**



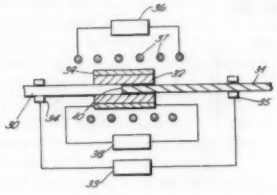
1. An article exhibiting a two-way shape memory effect, which is comprised of a one-way shape memory constituent having at least two regions, wherein said constituent is caused to exhibit a two-way shape memory effect by the presence of a second constituent which induces stresses resisting said one-way memory effect in at least one of said two regions, said second constituent being caused to be present in said article by at least one of brazing, welding, roll bonding, extrusion or hot isostatic pressing.

4,518,445

METHOD FOR MAKING ELECTRICAL CABLES

Jack R. Pedersen, Moss, and Sigmund Ege, Oslo, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,530
Claims priority, application Norway, Mar. 7, 1983, 830769
Int. Cl.³ B21F *15/06, 15/08*
U.S. Cl. 156—49 **14 Claims**



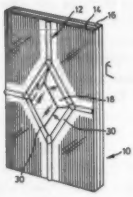
1. A method for manufacturing a continuous conductor from conductor sections comprising the steps of:
placing a jointing composition into a sleeve;
positioning conductor sections to be joined in the sleeve in end-to-end relationship such that their adjacent ends border the jointing composition;
heating the sleeve to a temperature at which the jointing composition becomes flowable and fuses the adjacent ends; and
removing the sleeve.

4,518,446

METHOD OF MAKING BEVELLED GLASS WINDOW

Frank E. Drennan, Etobicoke, Canada, assignor to Dor Seal Limited, Toronto, Canada

Continuation-in-part of Ser. No. 258,060, Apr. 28, 1981, abandoned. This application Nov. 18, 1983, Ser. No. 553,099
Int. Cl.³ B44C *5/08*
U.S. Cl. 156—63 **2 Claims**



1. A method of making a glass or like window having a face wherein the face of the window is ornamentally divided into a plurality of lites by came secured thereto, the undersurface of the came being formed with an open channel for adhesive to secure the came to the face of the window, comprising the steps of:
forming splines on a jig surface in the configuration of said plurality of lites;
piecing said channeled lead came over said splines, the splines entering the channels;
said splines having a height to engage with the bottoms of the channels in the came;
joining the pieces of came at their intersections;
laminating the area of at least one of said lites on the face of said window with a sheet of decorative material having a thickness of at least $\frac{1}{8}$ of an inch whereby the area so laminated is elevated from the plane face of the window;
forming said jig surface at the marginal areas adjacent each side of said splines to duplicate in elevation the marginal areas of the lites on said face of said window;
pressing said came against the jig surface by placing a rigid board laminated with a resilient sheet over the jig surface with the resilient sheet in contact with the came, pressing the board against the jig surface to compress the resilient sheet against the came to force the bottom of the channelled came against the spline and turn the sides of the channelled came to conform the edges of the channel of the came to the elevation of the jig surface at the marginal areas to the splines;
removing said came from said splines with its underside so conformed and depositing an adhesive in the channels of the came;
aligning the configuration of the came to the configuration of the lites on the face of the window so that the came overlies the boundaries between the lites; and
pressing the window and the came together to adhesively secure the came to the window.

4,518,447

METHOD OF MAKING MULTI-SECTION DECORATIVE PANEL

Phillip D. Daniels, 4797 Lake Bluff, West Bloomfield Township, Pontiac County, Mich. 38033

Filed Jul. 11, 1980, Ser. No. 167,422
Int. Cl.³ E04B *2/00*; B32B *31/00*
U.S. Cl. 156—71 **2 Claims**

1. A method of making and installing on a wall surface or the like a multi-width panel having an overall surface decoration, comprising the steps of:
(1) extruding and decorating said panel with said overall surface decoration applied to the full panel width,
(2) slitting the panel longitudinally into partial width sec-

tions after extrusion and decoration, but without relative movement of the panel sections,

(3) applying an adhesive sheet to the non-decorated side of each of the panel sections while retaining the slit sections in position to retain the overall surface decoration, the adhesive sheet bridging the slit line between adjacent sections to thereafter retain the panel sections against misalignment,

(4) folding the taped sections in the direction of the tape, so that the adhesive sheet forms a hinge,

(5) unfolding the taped sections at the installation location, and

(6) securing said sections, while still taped and while still retained in registry, to a supporting surface to reform the overall surface decoration without any misalignment of the panels.

4,518,448

CLOSURE ASSEMBLY AND METHOD OF USING IT

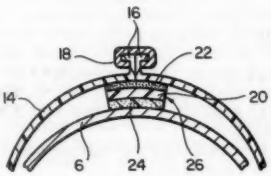
Rene H. Henry, Hasselt, and Jean M. E. Nolf, Hamme-mille, both of Belgium, assignors to N. V. Raychem S.A., Belgium

Continuation of Ser. No. 308,886, Oct. 5, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 554,371

Claims priority, application United Kingdom, Oct. 9, 1980, 8032538

Int. Cl.³ B32B *31/26*

U.S. Cl. 156—86 **22 Claims**



19. A method of enclosing a substrate wherein a wraparound sleeve is closed around the substrate by closure means which hold together longitudinal edge regions of the sleeve, a sealing member is located internally adjacent the sleeve to extend at least along said edge regions and the sleeve and sealing member are urged together by an urging means situated radially inwardly of the sealing member to effect a seal between said edge regions.

4,518,449

PROCESS FOR PRODUCTION OF HYDRATE SURFACED ROLLED COPPER FOIL LAMINATED PLATES

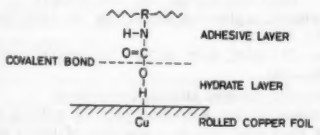
Osao Kamada, Tokyo, Japan, assignor to Hitachi Cable Limited, Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,439

Claims priority, application Japan, Oct. 27, 1983, 58-201685

Int. Cl.³ B32B *31/12*

U.S. Cl. 156—153 **8 Claims**



1. A process for producing a copper foil laminated plate comprising a rolled copper foil and an insulating substrate, which process comprises the steps of:

(a) cleaning the surface of the rolled copper foil;

(b) grinding or abrading the above-cleaned surface to activate it;

(c) bringing the above-treated surface into contact with water or steam to form a strong hydrate layer on the surface;

(d) coating the surface with the hydrate layer formed thereon with an adhesive capable of bonding, physically or chemically to a —OH group;

(e) precuring the above-coated adhesive; and

(f) placing the insulating substrate on the adhesive-coated side of the rolled copper foil and heat-pressing the insulating substrate and foil.

4,518,450

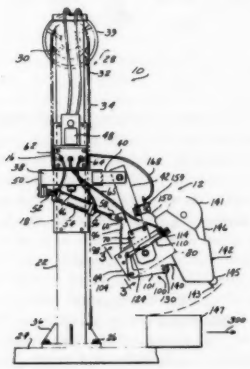
LABEL DISPENSING APPARATUS

Bruno D. Warmann, 15362 Fairlane Dr., Livonia, Mich. 48154

Filed Dec. 8, 1983, Ser. No. 559,213

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—566 **6 Claims**



1. An automatic label dispensing apparatus for dispensing a label on an article to be marked, said apparatus comprising:

a label applicator having an ejector end at which a label is adapted to be positioned upon actuation of said applicator, said positioned label being adapted for contact with an article to be marked thereby;

first actuating means for activating said label applicator;

a first support member;

an arm member having one end pivotally carried by said support member, the other end extending therefrom;

an applicator support member pivotally carried by said other end of said arm member, said label applicator being carried by said applicator support member and movable therewith;

second actuating means for pivoting said arm member such that said ejector end of said applicator moves in a first direction along an arcuate path and into contact with said article to be marked, said support member being pivotally movable in a second direction opposite said first direction upon contact of said ejector end of said applicator with said article to be marked such that said ejector end tangentially contacts said object and deposits said label thereon;

a trigger mechanism, the actuation of which positions said label at said ejector end; said first actuating means comprising a roller mechanism pivotally carried by said applicator support member and having a grooved surface engaging said trigger mechanism and cylinder means responsive to fluid pressure to pivot said roller toward said trigger mechanism to actuate said label applicator, said cylinder means being operable to move said roller mechanism in the opposite direction to deactivate said applica-

tor, said cylinder means and pivotally mounted roller being carried by said applicator support member.

4,518,451

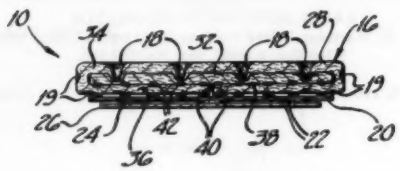
EMBOSSED PANTY LINER

Thomas J. Luceri, Little Ferry, and Kenneth J. Molee, Hightstown, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Sep. 2, 1982, Ser. No. 414,104

Int. Cl.³ A61F *13/16, 13/18;* **B31F** *1/20;* **B32B** *31/22*

U.S. Cl. 156—202 **4 Claims**



1. A method for manufacturing an embossed absorbent body for an absorbent liner for undergarments comprising:

passing an elongated sheet of absorbent material having a first and a second major surface to an assembly line;

superimposing, on a central, longitudinal portion of the first major surface of said elongated sheet, the first major surface of an absorbent insert with said sheet extending tranversely on either longitudinal side of said insert;

imposing onto the second major surface of said sheet, a pattern of depressed area, said pattern extending transversely beyond said insert and onto said side extensions of said sheet, said depressed areas being deeper in the portion of said sheet overlaid by said insert than said depressed areas in said side extensions of said sheet;

folding said side extensions of said sheet onto the second major surface of said insert to form said absorbent body.

4,518,452

METHOD FOR PRODUCING A GRINDING- OR POLISHING DISC AND A MACHINE FOR THIS PURPOSE

Keld O. Hundebol, Kanalvej 22, Ansager, Denmark (6823)

PCT No. PCT/DK81/00104, § 371 Date Jun. 30, 1982, § 102(e) Date Jun. 30, 1982, PCT Pub. No. WO82/01845, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 20, 1981, Ser. No. 395,001

Claims priority, application Denmark, Nov. 24, 1980, 4998/80

Int. Cl.³ B31F *3/00*

U.S. Cl. 156—211 **2 Claims**

1. A method for producing a grinding or polishing disc having flexible grinding members, comprising the steps of:

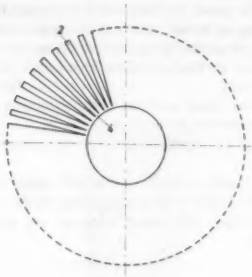
providing a rectangular sheet of an abrasive material;

making a plurality of parallel transverse cuts from opposite longitudinal edges in toward the longitudinal centre line of said sheet, and terminating said cuts short of said center line, to thereby form a central longitudinal area with a plurality of segments extending outwardly therefrom;

placing a string of a solid, deformable heat-activatable adhesive material along said center line at least for the entire length of said sheet;

folding said sheet around said string of adhesive about said center line;

bending said folded sheet along said center line to form a circle; and



joining the end portions of said central area together in abutting relation to form a closed ring by applying heat to said string.

4,518,453

METHOD OF PROCESSING THE OUTSIDE SURFACES OF A SKI

Karl R. Kiisler, Yakhimekhe tee, 26; Tiiya-Maya F. Sjuld, ulitsa Vyayana, 14, kv. 2; Peep G. Kristyanson, ulitsa Sjutiste tee, 34, kv. 38, all of Tallin; Gunnar B. Kholm, ulitsa Vyidu 18, kv. 10, Pyarnu; Juri K. Rokk, ulitsa Oya, 112 "b", kv. 41, Pyarnu, and Kalju M. Post, ulitsa Lekhola, 69, Pyarnu, all of U.S.S.R.

Filed Jun. 16, 1983, Ser. No. 504,810

Claims priority, application U.S.S.R., Jun. 17, 1982, 3457547

Int. Cl.³ A63C *5/00, 5/12;* **C09J** *5/02, 5/06*

U.S. Cl. 156—307.5 **7 Claims**

1. A process for manufacturing at least one outside surface of a ski, comprising the steps of:

a. treating a fibrous material selected from the group consisting of paper, a non-woven fabric made of synthetic fiber, and a non-woven fabric made of natural fiber, with a compound comprising a phenolic resin, having a dry matter content of from about 60 to about 80 mass percent, and being curable at from about 100° C. to about 120° C.;

b. heating the treated fibrous material at from about 70° C. to about 90° C. for a period of time which is long enough for the phenolic resin to undergo partial polycondensation;

c. applying the partially polycondensed phenolic resin treated fibrous material directly to at least one outside surface of a ski blank; and

d. exposing the ski blank with fibrous material applied thereto to a temperature of from about 100° C. to about 120° C. and a pressure of from about 0.5 MPa to about 2.0 MPa thereby causing complete polycondensation of said phenolic resin to occur and strong adhesion of said fibrous material to said ski blank.

4,518,454

MANUALLY-OPERATED LABELER

Mituo Fujita, Sakatoshi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Toyko, Japan

Filed Sep. 2, 1982, Ser. No. 414,033

Claims priority, application Japan, Sep. 26, 1981, 56-153400; Nov. 9, 1981, 56-178308

Int. Cl.³ B44C *3/00;* **B32B** *1/00;* **B65H** *1/00*

U.S. Cl. 156—541 **7 Claims**

1. A manually operated labeler, comprising:

a main casing having a holding part for holding a roll of carrier strip onto which a plurality of labels are stuck consecutively;

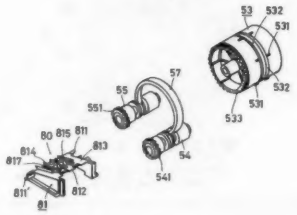
a carrier strip turnback part which turns back the carrier strip as it is drawn from said holding part over said carrier strip turnback part to strip the labels from the carrier strip;

a feeding device having a feed drum for engaging the carrier strip and drawing it over said carrier strip turnback part;

a driving means connected to said feeding device for driving said feeding device to intermittently draw the carrier strip over said carrier strip turnback part;

a circular guide member positioned along an outer periphery of said feed drum in said main casing and spaced from said feed drum to define a carrier strip feeding clearance between said circular guide member and the outer periphery of said feed drum;

a feed-in roller on said main casing adjacent said feed drum ahead of, relative to a direction of the movement of the carrier strip, for feeding the carrier strip into said carrier strip feeding clearance in cooperation with said feed drum, and a feed-out roller on said main casing adjacent



said feed drum behind, relative to the direction of movement of the carrier strip, for feeding the carrier strip from said carrier strip feeding clearance in cooperation with said feed drum; and

a pivotable frame positioned between said feed-in roller and said feed-out roller around the part of said feed drum other than that along which said circular guide member is positioned and pivotable independently of said feed-in and feed-out rollers into and out of a position in which said pivotable frame substantially covers the outer periphery of said feed drum between said feed-in and feed-out rollers, said pivotable frame having at least one stripper thereon which projects into the path of the carrier strip when said pivotable frame is in said position for separating the carrier strip from said feed drum.

4,518,455

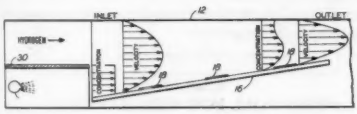
CVD PROCESS

Kevin A. Muething, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,227

Int. Cl.³ C30B *25/14*

U.S. Cl. 156—613 **5 Claims**



1. A method for depositing reactants on the surface of a semiconductor wafer positioned in an elongated hollow member in a chemical vapor deposition reactor, the method comprising the steps of:

heating the wafer;

directing a first gas stream containing gaseous reactant compounds in a gaseous ambient containing hydrogen along the hollow member to deposit reactants on the surface of the heated wafer; and

simultaneously directing a second gas stream comprised of the hydrogen-containing gaseous ambient along the hollow member between the gaseous reactant compounds and the inner surface of the hollow member to substantially eliminate the deposition of reactants thereon without interfering with the deposition of reactants on the wafer.

4,518,456

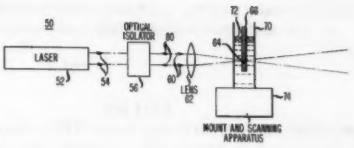
LIGHT INDUCED ETCHING OF INP BY AQUEOUS SOLUTIONS OF H_3PO_4

John E. Bjorkholm, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 11, 1983, Ser. No. 474,684

Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—626 **7 Claims**



1. A method of etching a predetermined pattern into a Group III-V semiconductor crystal comprising the steps of:

placing said crystal in an aqueous solution of H_3PO_4;

while said crystal is in contact with said solution, illuminating predetermined regions of said crystal with light so that etching proceeds at said illuminated predetermined regions;

focusing said light to a spot having a spot size less than 500 Angstroms on said crystal; and

moving said spot on said crystal so that a groove is etched in said crystal.

4,518,457

RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

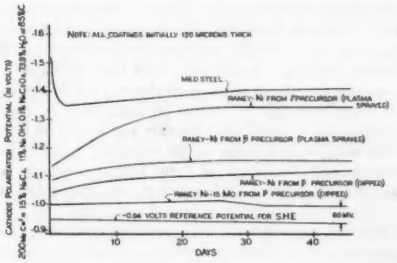
Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 179,150, Aug. 18, 1980, Pat. No. 4,370,361, which is a division of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Mar. 17, 1982, Ser. No. 358,975

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ B01J *21/04*

U.S. Cl. 156—656 **19 Claims**



1. A method of producing a monolithic, non-pyrophoric, low overvoltage electrode for use as a hydrogen evolution cathode for the electrolysis of brine in an electrolytic cell which comprises the steps of:

(a) coating with aluminum the surface of a clean, non-porous conductive metal substrate comprised of a nickel-molybdenum alloy having a weight percent molybdenum within

the range of from about 5 to about 20 and a weight percent nickel within the range of from about 80 to about 95;

(b) heat treating said coated surface by maintaining said surface at a temperature within the range of from about 660° C. to about 860° C. for a time about 1 to about 30 minutes to diffuse a portion of said aluminum into outer portions of said structure to produce an integral nickel-molybdenum-aluminum alloy larger in said outer portions predominantly of Beta phase grains but insufficient to create a predominance of Gamma phase grains in said outer portions;

(c) leaching out residual aluminum and intermetallics from the alloy layer until a porous Raney nickel-molybdenum layer is formed integral with said structure; and

(d) chemically treating said Raney nickel-molybdenum layer so that said layer is substantially non-pyrophoric.

4,518,458

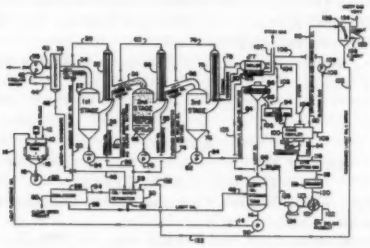
PROCESS FOR REMOVING LIGHT OIL FROM SOLIDS

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Filed Sep. 17, 1982, Ser. No. 419,574

Int. Cl.[3] B01D *1/14, 5/00, 12/00;* **F26B** *7/00*

U.S. Cl. 159—47.1 **18 Claims**



1. A process for the recovery of clean water and substantially dry, fluidizing oil-free solids from aqueous solids dehydrated in a light fluidizing oil medium comprising the steps of (1) admixing aqueous solids with a low viscosity, relatively volatile water-immiscible light fluidizing oil boiling within the range of from about 150° F. to about 550° F. to obtain a mixture which will remain fluid and pumpable after the removal of the water content therefrom; (2) subjecting the resultant oil-containing mixture to dehydration by heat evaporation whereby substantially all the water and part of the fluidizing oil are vaporized, yielding a mixed water and light oil vapor and a substantially anhydrous solids in oil slurry; (3) condensing said mixed water and light oil vapor; (4) separating the resultant condensate into a clean water fraction and a light oil fraction; (5) separating at least some of the relatively volatile, water-immiscible light fluidizing oil from said substantially anhydrous solids in oil slurry; (6) bringing the resultant solids carrying residual light fluidizing oil into direct contact with a hot, inert blowing gas selected from a group of consisting of gaseous products of combustion, nitrogen and carbon dioxide to thereby remove said light oil from said substantially anhydrous solids by heat evaporation; (7) condensing light oil vapor in effluent blowing gas and separating it therefrom; (8) admixing the separated light oil from step (7) with fresh aqueous solids and thereby recycling it through the process as fluidizing oil, and (9) combining the separated light oil fractions of steps (4) and (5) and admixing them with fresh aqueous solids and thereby recycling them through the process as fluidizing oil.

4,518,459

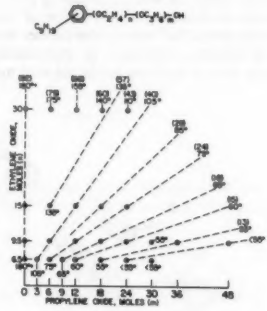
METHODS OF DEINKING SECONDARY FIBERS

Richard E. Freis, Bloomington; James E. Maloney, Eagan, and Thomas R. Oakes, May, all of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation of Ser. No. 93,744, Nov. 13, 1979, abandoned. This application Jan. 17, 1983, Ser. No. 458,432

Int. Cl.[3] D21C *5/02*

U.S. Cl. 162—5 **23 Claims**



1. A washing method for the production of substantially decontaminated secondary fiber from relatively contaminated secondary fiber, comprising the steps of:

(a) suspending the relatively contaminated secondary fiber in an aqueous medium in the presence of less than about 1% of the weight of said contaminated fiber of a single foam-suppressing surface active agent consisting essentially of:

$$R—(AR)—(OC_2H_4)_m—(OC_3H_6)_n—Y;$$

wherein R represents a monovalent higher aliphatic group containing from 6 to 24 carbon atoms,

Ar represents an aromatic residue,

$—(OC_2H_4)_m—$being a poly (ethylene oxide) chain,

$—(OC_3H_6)_n—$being a poly (propylene oxide) chain;

m is about 6 to about 15,

n is about 12 to about 48,

m:n is less than 1, and

Y is selected from the group consisting of hydroxyl and benzyl ether, the temperature of said aqueous medium being in the range of about 25° C. to about 85° C., whereby contaminants of the relatively contaminated secondary fiber become uniformly distributed throughout said aqueous medium; and

(b) substantially separating the resulting substantially decontaminated secondary fiber from the resulting contaminant-containing aqueous medium.

4,518,460

PRESS ROLL FOR WEB MATERIAL

Ludwig Hauser, and Wilhelm Wanke, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

PCT No. PCT/EP82/00007, § 371 Date Sep. 21, 1982, § 102(e) Date Sep. 21, 1982, PCT Pub. No. WO82/02567, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 21, 1982, Ser. No. 425,088

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102526

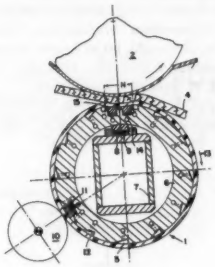
Int. Cl.[3] D21F *3/02, 3/08*

U.S. Cl. 162—361 **12 Claims**

1. A press roll, for cooperating with an associated roll at a nip, to press web material between the press and associated rolls at the nip, the press roll comprising:

a relatively rigid, relatively stationary, inner shell having an outer periphery and an inner periphery, the outer periphery having a substantially circular cross section; the inner shell further having a space defined therein at the outer periphery and open toward the nip, said space not extending through the inner periphery;

a relatively more flexible, elastically deformable, outer shell supported outside the inner shell, and the outer shell including an inner side for sliding on and over the inner shell



outer periphery; the outer shell being rotatable with respect to the inner shell;

a pressure ledge located at the nip and having a length around the press roll for extending past the nip and for forming an extended nip; the pressure ledge resting against the inner side of the outer shell; the pressure ledge being movably mounted in the space in the inner shell; and

pressure means in the inner shell for urging the pressure ledge outwardly against the inner side of the outer shell.

4,518,461

SUPPORT FOR BATTERIES OF COKING FURNACES HEATED FROM THE TOP

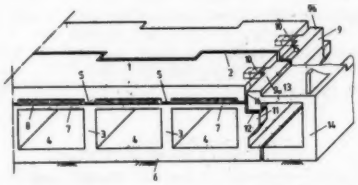
Jan Gelfand, Ratingen-Lintorf, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,142

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210372

Int. Cl.³ C10B *29/00, 45/00*

U.S. Cl. 202—270 **12 Claims**



1. In combination a battery of coking furnaces of the type being heated from the top and having regenerators, and a support for said battery comprising

a plurality of waste heat passages formed beneath the regenerators and extending in a longitudinal direction of the battery;

a foundation formed by a floor member and also by wall members of said waste heat passages, and having a plurality of consoles;

a furnace supporting plate slidingly supported on said wall members and repeatedly subdivided transversely to the longitudinal direction of the battery so as to form a plurality of plate portions; and

two longitudinal bars each located at a machine side and at a coke side of the battery and slidingly supported on said plurality of consoles of said foundation, each of said longitudinal bars engaging said plate portions of said furnace supporting plate and fixing them in their positions.

4,518,462

DISTILLATION PROCESS FOR PURIFYING METHYL METHACRYLATE

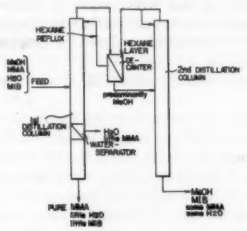
Atsushi Aoshima, Yokohama; Yoshio Suzuki, and Mikihiko Nakamura, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 272,598, Jun. 11, 1981, abandoned. This application May 25, 1983, Ser. No. 497,783

Claims priority, application Japan, Jun. 20, 1980, 55-83542; Jun. 20, 1980, 55-83543

Int. Cl.³ B01D *3/36;* **C07C** *67/54*

U.S. Cl. 203—39 **5 Claims**



1. In the process for purifying methyl methacrylate by feeding a feed mixture containing methanol, methyl methacrylate and 0.05 to 2% by weight, based on the weight of the methyl methacrylate, of methyl isobutyrate to a first distillation column, subjecting the same to distillation therein in the presence of a saturated hydrocarbon having 6 or 7 carbon atoms above the feed stage while distilling out an azeotropic mixture of said saturated hydrocarbon and the methanol, condensing the azeotropic mixture from the first distillation column, sending the resulting condensate to a decanter to separate it into a layer consisting mainly of the hydrocarbon and a layer consisting mainly of methanol, returning the layer consisting mainly of the hydrocarbon to the top of the first distillation column, feeding the layer consisting mainly of the methanol to a second distillation column, distilling the hydrocarbon dissolved in the methanol layer, together with a part of the methanol, out of the top of the second column, condensing and sending it to the above-mentioned decanter, recovering methanol from the bottom of the second distillation column, and recovering methyl methacrylate from the bottom of the first distillation column, the improvement which comprises

(1) cooling said decanter to 0°–13° C. to conduct the layer-separation,

(2) controlling the amount of the hydrocarbon resident in the upper part of the first distillation column so that a small amount of methyl methacrylate is also distilled out of the top of the first distillation column, and

(3) feeding the layer consisting mainly of methanol layer-separated in the above decanter, to the second distillation column having distillation stages above the feed stage, and returning a part of the distillate from the top of the second distillation column to the top of the second distillation column, thereby recovering methyl isobutyrate and a small amount of methyl methacrylate along with methanol from the bottom of the second distillation column, and separating methanol and methyl isobutyrate from the feed mixture to the first distillation column.

2. In the process for purifying methyl methacrylate by feeding a feed mixture containing methanol, methyl methacrylate, water and 0.05 to 2% by weight, based on the weight of the

methyl methacrylate, of methyl isobutyrate to a first distillation column, subjecting the same to distillation therein in the presence of a saturated hydrocarbon having 6 or 7 carbon atoms above the feed stage while distilling an azeotropic mixture of said saturated hydrocarbon and methanol out of the top, condensing the azeotropic mixture from the first distillation column, sending the resulting condensate to a decanter to separate it into a layer consisting mainly of the hydrocarbon and a layer consisting mainly of methanol, returning the layer consisting mainly of the hydrocarbon to the top of the first distillation column, feeding the layer consisting mainly of the methanol to a second distillation column, distilling the hydrocarbon dissolved in the methanol layer, together with a part of the methanol, out of the top of the second column, condensing and sending it to the above-mentioned decanter, recovering methanol from the bottom of the second distillation column, separating a mixture of H_2O and methyl methacrylate at the bottom of the first distillation column into a layer consisting mainly of methyl methacrylate and a layer consisting mainly of water, withdrawing said water layer to recover the methyl methacrylate, and recovering methyl methacrylate from the bottom of the first distillation column, the improvement which comprises

(1) cooling said decanter to 0°–13° C. to conduct the layer-separation,

(2) controlling the amount of the hydrocarbon resident in the upper part of the first distillation column so that a small amount of methyl methacrylate is also distilled out of the top of the first distillation column, and

(3) feeding the layer consisting mainly of methanol layer-separated in the above decanter, to the second distillation column having distillation stages above the feed stage, and returning a part of the distillate from the top of the second distillation column to the top of the second distillation column, thereby recovering methyl isobutyrate and a small amount of methyl methacrylate along with methanol from the bottom of the second distillation column, and separating methanol, water and methyl isobutyrate from the feed mixture to the first distillation column.

4,518,463

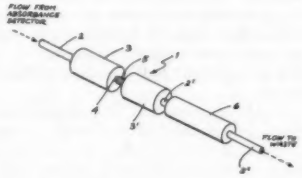
POTENTIOMETRIC METHOD

Peter W. Alexander, Maroubra, and Paul R. Haddad, Eastwood, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Continuation of Ser. No. 249,373, Mar. 31, 1981, abandoned. This application Apr. 13, 1983, Ser. No. 484,703

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**



1. A method of detecting amino acids and other organic copper-complexing agents in a fluid, said method comprising the steps of:

providing a potentiometric electrode detector comprising a flow-through copper metal tube electrode having a volume in the range of 0.2 to 2 μl and being flow-coupleable to said fluid, said detector including a tubular inlet of material inert to the fluid to be analyzed, a flow-through reference electrode located downstream of said inlet, and an inert flow-through spacer located downstream of said reference electrode, said copper metal tube electrode being located downstream of said spacer, said electrode providing a voltage response to the amino acid or other organic copper-complexing agent to be detected;

passing said fluid to be analyzed through said detector; and measuring said voltage response to thereby detect said amino acid or other organic copper-complexing agent.

4,518,464

METHOD OF DETECTING EMBRITTLEMENT OF HEAT-RESISTING STEEL

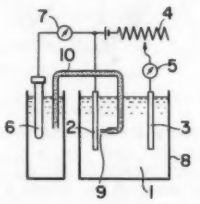
Hideaki Takahashi; Tetsuo Shoji, both of Sendai; Kiyoshi Saitoh, Yokohama; Masamitsu Muramatsu, Sagamihara, and Kazushige Kimura, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki; Hideaki Takahashi and Tetsuo Shoji, both of Sendai, all of, Japan

Filed Jul. 5, 1984, Ser. No. 627,832

Claims priority, application Japan, Jul. 6, 1983, 58/122566

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**



1. A method of detecting embrittlement of a heat-resisting steel which comprises evaluating the brittleness of the heat-resisting steel on the basis of the repassivation current value obtained by the steps of:

(a) connecting the heat-resisting steel as the anode of an anode polarization curve measuring apparatus wherein an aqueous solution containing an organic acid and an alkylbenzene sulfonic acid or its salt is used as an electrolytic solution; and

(b) raising the anode potential from an active region to a passive region and thereafter lowering the anode potential to measure the repassivation current value.

4,518,465

METHOD OF MANUFACTURING PRINTED WIRING BOARDS

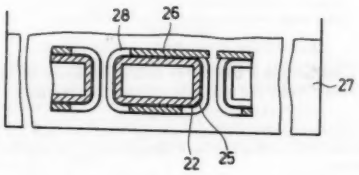
Etsuji Morimoto, and Keijiro Orito, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,880

Claims priority, application Japan, Sep. 17, 1983, 58-170619

Int. Cl.³ C25D *5/02, 7/04*

U.S. Cl. 204—15 **7 Claims**



1. A method of manufacturing a printed wiring board including a wet plating process which comprises immersing a base substrate with a multiplicity of through-holes having two major surfaces in a plating bath to coat metal films over the two surfaces of said base substrate and the inner walls of said through-holes therein wherein said metal films formed over

the inner walls of said through-holes form via-holes for electrically connecting said metal films formed over the two surfaces of said base substrate with each other, said wet plating process comprising the steps of: (a) taking said base substrate out of said plating bath for a first predetermined period of time, to thereby cause disintegration of bubbles on the surfaces of said base substrate and the inner walls of said through-holes therein; and (b) then again immersing said base substrate into said plating bath for a second predetermined period of time to resume formation of said metal films on the surfaces of said base substrate and the inner walls of said through-holes therein.

4,518,466

WEB CONVEYING METHOD

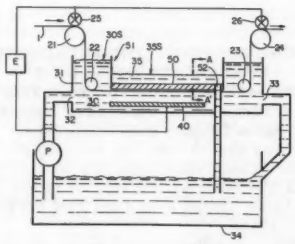
Masahiro Takahashi; Toshio Hagiwara; Tsutomu Kakei, and Kazutaka Oda, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd. and Nippon Light Metal Company Ltd., both of, Japan

Division of Ser. No. 238,909, Feb. 27, 1981, Pat. No. 4,432,854. This application Dec. 9, 1983, Ser. No. 559,998

Claims priority, application Japan, Feb. 28, 1980, 55-24773

Int. Cl.[3] C25D *7/06*

U.S. Cl. 204—28 **3 Claims**



1. A method of conveying a web through a fluid bath while maintaining said web substantially planar, said method comprising the steps of:

passing said web through said bath adjacent a first side of a guide plate having first and second sides and having at least one hole therein; and

maintaining a static fluid pressure adjacent said first side of said guide plate which is higher than a static fluid pressure adjacent said second side of said guide plate, whereby said fluid flows through said hole and said fluid urges said web against said first side of said guide plate.

3. The web conveying method of claim **1** further comprising the step of providing an electrode substantially parallel to said guide plate on the side of a web opposite said guide plate; and applying an electric current flowing between said electrode and said web.

4,518,467

SELECTIVE SOLAR SURFACES

John J. Mason, Walsall; Michael T. Cunningham, Harbourne, and Jeffrey N. Crosby, Melksham, all of England, assignors to INCO Selective Surfaces Limited, Birmingham, England

Continuation-in-part of Ser. No. 382,172, May 26, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,198

Claims priority, application United Kingdom, Jun. 1, 1981, 8116642; Apr. 14, 1982, 8210803

Int. Cl.[3] C23B *5/06;* **C23F** *7/26*

U.S. Cl. 204—37.1 **6 Claims**

1. A process for the production of a solar collector for operation at temperatures in the range 100° to 300° C. or more comprises immersing a stainless steel plate in a solution of chromic acid and sulphuric acid, with or without other constituents, at a temperature of about 65° C. or more, to give a colored heavily hydrated chromium-rich spinel oxide surface film of thickness of from about 0.02 to about 0.5 μm, said surface film comprising a tortuous network of interlinking pathways of effective length of about twice the film thickness, washing and drying the surface and subjecting it to DC electrolysis in a bath selected from the group comprising a nickel plating bath and a palladium plating bath, said electrolysis continuing from a time sufficient to deposit metal into the pores and thereby effect a color change of the oxide film but insufficient for metal to be deposited on the surface of the film.

4,518,468

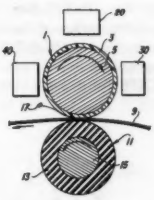
PROCESS FOR MAKING ELECTROSTATIC IMAGING SURFACE

Richard A. Fotland, Holliston, and Leo A. Beaudet, Milford, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 22, 1983, Ser. No. 468,435

Int. Cl.[3] C25D *11/06*

U.S. Cl. 204—38.3 **11 Claims**



1. A method of treating a member to form a dielectric surface layer, comprising the steps of:

hardcoat anodizing the member, which is comprised of a material selected from the group consisting of aluminum and aluminum alloys, to form an oxide surface layer having a plurality of pores and a barrier layer,

heating the aluminum member to an elevated temperature in the range of 120°–180° C.,

impregnating the pores of the oxide surface layer with a material selected from the group consisting of carnauba wax, montan wax, and compounds of said waxes while the member is at a temperature above the melting point of the impregnating wax, to form a dielectric surface layer with a resistivity in excess of 10^{12} ohm-centimeters, and

removing any of the wax on the exterior of the dielectric surface layer.

4,518,469

METHOD OF MAKING NON-PRECIOUS METAL ELECTRICAL CONTACTS BY ELECTROPLATING

Sau-Lan L. NG, Lawrence Township, Mercer County; John T. Plewes, Chatham Township, Morris County, and Murray Robbins, Berkeley Heights Township, Union County, all of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

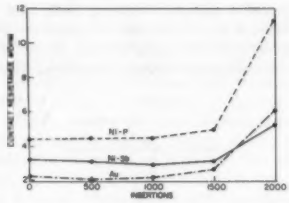
Filed Aug. 31, 1984, Ser. No. 646,665

Int. Cl.[3] C25D *3/56*

U.S. Cl. 204—44.5 **18 Claims**

1. A method of depositing an alloy of nickel and antimony on a substrate comprising from 1 to 70 weight percent anti-

mony and the balance nickel comprises electroplating said alloy from an acidic solution comprising a soluble nickel salt



and a soluble mixed alkali metal-antimony salt of a polybasic organic acid wherein said substrate is made the cathode.

4,518,470

ION EXCHANGE MEMBRANE CELL AND ELECTROLYTIC PROCESS USING THEREOF

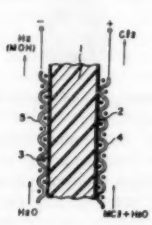
Yoshio Oda; Takeshi Morimoto, and Toshiya Matsubara, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 479,902, Mar. 29, 1983, Pat. No. 4,468,301, which is a continuation of Ser. No. 288,684, Jul. 31, 1981, abandoned. This application May 2, 1984, Ser. No. 606,197

Claims priority, application Japan, Jul. 31, 1980, 55-104284

Int. Cl.[3] **C25B** *1/34, 9/00, 13/02, 13/08*

U.S. Cl. 204—98 **15 Claims**



1. An electrolytic cell, which comprises:

an anode and a cathode which are partitioned by an ion exchange membrane having at least one surface roughened, said surface roughening being defined by a fine concavo-convex structure wherein the average depth (height) of said structure ranges from 0.01 to 30μ with the average number of surface roughening concavo-convex structures ranging from 1 to 10^{13} per mm^2, and wherein at least one of said anode and said cathode contacts one of the roughened surfaces of said membrane.

4,518,471

TWO STEP ELECTROCHEMICAL ETCH PROCESS FOR HIGH VOLT ALUMINUM ANODE FOIL

Mulk R. Arora, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,876

Int. Cl.[3] **C25F** *3/04*

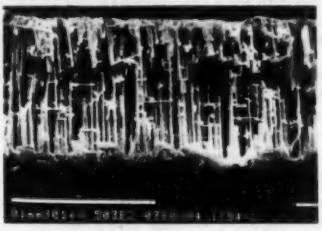
U.S. Cl. 204—129.1 **12 Claims**

1. A two step process for etching aluminum electrolytic capacitor anode foil wherein such foil has a high cubic texture, greater than 70% cubicity, comprising a first step of:

treating said foil in an electrolyte bath containing between 1.5% and 7% hydrochloric acid and 0% to 2% aluminum as a chloride under the influence of direct current at a temperature between 70° C. and 85° C.; and

passing a charge of 6 to 25 coulombs through said foil while said foil is immersed in said hydrochloric acid bath and having a current density between 0.25 and 0.60 amps/cm^2; and

in a second step, treating said foil emerging from said first



bath in an electrolyte bath consisting of from 1.5 to 7% hydrochloric acid and between 0% to 2% aluminum as aluminum chloride, under the influence of direct current having a current density of 0.10 to 0.15 amps/cm^2, with 40 to 50 etch coulombs at a temperature of 75° to 90° C.

4,518,472

DELUSTERING COATING COMPOSITION EXCELLENT IN ABRASION RESISTANCE

Kazuo Kishida; Isao Sasaki, both of Hiroshima; Kenji Kushi, and Masahiro Sugimori, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,895

Claims priority, application Japan, Sep. 10, 1982, 57-156832; Sep. 11, 1982, 57-157408; Sep. 13, 1982, 57-157991

Int. Cl.[3] **C08F** *220/00, 2/48;* **C08J** *7/04;* **C09D** *3/00*

U.S. Cl. 204—159.15 **24 Claims**

1. A coating composition curable by an activation energy ray, which comprises (a) 100 parts by weight of a monomer mixture (A) comprising at least 30% by weight of a compound having at least 3 acryloyloxy and/or methacryloyloxy groups in the molecule and up to 70% by weight of a compound having 1 to 2 α,β-ethylenically unsaturated bonds in the molecule, (b) 0.01 to 6.0 parts by weight of at least one photosensitizer and (c) 0.5 to 30 parts by weight of a crosslinked polymer or copolymer obtained by emulsion copolymerization of a reactive monomer having one α,β-ethylenically unsaturated bond in the molecule and a reactive monomer having at least two α,β-ethylenically unsaturated bonds in the molecule.

4,518,473

COMPOSITIONS AND PROCESS

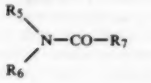
Anthony F. Jacobine, Meriden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 290,689, Aug. 6, 1981, Pat. No. 4,425,208. This application Oct. 11, 1983, Ser. No. 540,225

Int. Cl.[3] **C08F** *2/48;* **C08J** *2/28*

U.S. Cl. 204—159.18 **4 Claims**

1. In a method for the photopolymerization of ethylenically unsaturated compounds selected from the group consisting of polymerizable ethylenically unsaturated monomers, oligomers and polymers, the improvement which comprises employing as the photoinitiator a combination consisting essentially of an aromatic ketone sensitizer and from 20 to 200 parts by weight, per 100 parts by weight of said ketone sensitizer, of an N,N-disubstituted amide of the formula:



wherein R_5 and R_6 taken individually represent lower-alkyl, R_5 and R_6 taken together with the N atom to which they are attached represent the residue of a heterocyclic moiety having from 2 to 8 ring atoms and R_7 is selected from the class consisting of alkyl and aryl.

4,518,474

DEVICE FOR THE ELECTROLYTIC TREATMENT OF METAL STRIP

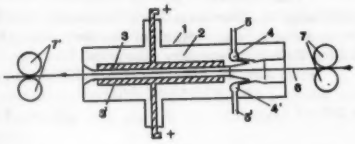
Maurizio Podrini, Via Castel del Rio n. 9, 00127 Roma, Italy

Filed May 7, 1984, Ser. No. 607,446

Claims priority, application Italy, May 16, 1983, 48300 A/83

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—206 **1 Claim**



1. A device for the continuous electrolytic treatment of metal strip, in which the elementary electrolytic treatment cell consists of a hollow chamber of rectangular section, through which the strip to be treated passes, and which has insoluble electrodes on both its larger faces, the electrical circuit being closed through the metal strip to be treated, characterized in that said elementary cell is immersed in the electrolyte, the forced flow of which within the treatment chamber is ensured by an ejector, the ejector is at the end of the cell the strip to be treated enters, the ejector feeds fresh electrolyte in a direction opposite the direction of strip movement thereby drawing electrolyte at high speed from the other end of the cell through the treatment chamber, and the treatment chamber is open at both ends to the free flow of electrolyte therethrough.

4,518,475

APPARATUS FOR METAL PRODUCTION BY ELECTROLYSIS OF A MOLTEN ELECTROLYTE

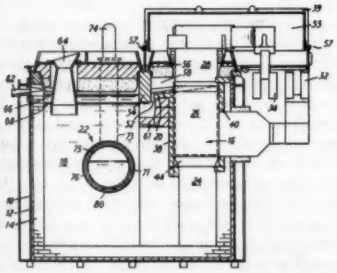
Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed May 27, 1983, Ser. No. 498,848

Claims priority, application United Kingdom, Jun. 14, 1982, 8217165

Int. Cl.³ C25C *3/00, 3/04, 7/00*

U.S. Cl. 204—247 **7 Claims**



1. An electrolytic cell for the production of metal by electrolysis of a molten chloride electrolyte which is more dense than the metal, comprising

an electrolysis chamber **16** including at least one electrode assembly of an anode **28**, a cathode **26** and at least one intermediate bipolar electrode **30**, the electrodes being arranged substantially vertically with substantially vertical electrolysis regions **39** between them, and a gas collection space **58** above the assembly,

a metal collection chamber **18** in communication with the top and the bottom of the electrolysis chamber, but screened from the gas collection space,

a weir **20** to permit a controlled flow of electrolyte/metal mixture from the top of the electrolysis chamber to the metal collection chamber, said weir being positioned at one end of the or each electrode assembly and extending transversely to the electrodes, and

means **22** for maintaining the surface of the electrolyte/-metal mixture in the electrolysis chamber at a substantially constant level,

the or each intermediate bipolar electrode having an anodic face which extends upwards to a height above the intended level of the electrolyte/metal mixture surface, a cathodic face which extends upwards to a height slightly below the intended level of the electrolyte/metal mixture surface, and a longitudinally-extending open-top channel **50** which slopes downwards toward the weir to convey electrolyte/metal mixture from the electrolysis region towards the weir.

4,518,476

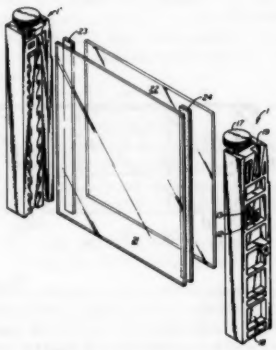
END CLAMP FOR GEL SLAB PLATE ASSEMBLY

Timothy E. Delony, San Leandro, and Daniel Y. M. Chu, San Francisco, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Apr. 17, 1984, Ser. No. 601,148

Int. Cl.³ G01N *27/26;* **B25B** *1/20*

U.S. Cl. 204—299 R **10 Claims**



1. A device for clamping together a plurality of plates along at least a portion of one edge of each with substantially uniform pressure, which comprises:

a housing having on one side thereof an elongate recess defined by a substantially flat back wall and first and second side walls, said first side wall being flat and said second side wall containing a plurality of parallel flat segments located at intervals along the length thereof, each segment facing at an angle with respect to said first side wall;

a first elongate bar movably mounted within said recess, having a first side facing said first side wall and a second side facing said second side wall, said first side being flat and parallel to said first side wall to define therewith a groove for receiving said plates, and said second side containing a plurality of parallel flat segments located at intervals along the length thereof, each segment facing at an angle equal but opposite to that of said parallel flat segments of said second side wall;

means for restricting the movement of said first elongate bar to a direction perpendicular to said first side wall;

a second elongate bar movably mounted within said recess between said first elongate bar and said second side wall of said recess, each side surface of said second elongate bar containing a plurality of parallel flat segments at angles and intervals indentical to those of the opposing segments on said first elongate bar and said second side wall of said recess, respectively; and

means for urging said second elongate bar lengthwise to urge said parallel flat segments on each side thereof against said parallel flat segments of said first elongate bar and said parallel flat segments of said second side wall of said recess, respectively, and thereby urge said first elongate bar toward said first side wall of said recess.

9. A sandwich-type gel slab plate assembly comprising:

a pair of flat rectangular glass plates of equal width with side edges in alignment;

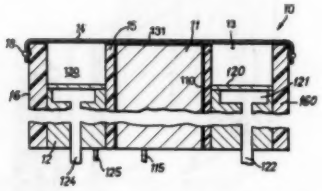
a pair of flat spacer bars disposed between said plates, one said bar aligned with each side edge of said plates; and

a pair of clamping devices according to claims 1, 2, 3, 4, 5, 6, 7 or 8, each said device clamping inside its respective groove said glass plates along one side edge thereof over one said spacer.

4,518,477
THERMAL PROTECTION FOR ELECTROANALYTICAL CELL AND AMPEROMETRIC PROBE

Harry D. Wright, Collonge-Bellerive; John M. Hale, Meinier, and Eugen Weber, Hinwil, all of Switzerland, assignors to Orbisphere Corporation Wilmington, Collonge-Bellerive, Switzerland

Filed Feb. 3, 1982, Ser. No. 345,536
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—415 **15 Claims**



12. In a membrane-enclosed amperometric probe comprising an elongated generally cylindrical body having a frontal sensor face at one end of said body; and electrolyte space covered by said membrane and in contact with at least two electrodes; and electrical connecting means extending from said electrodes through said body to a region near the other end of said body; the improvement consisting of said body including a thermal shield arranged within a jacket and including a heat conducting tubular member which extends through said body in an axial direction from a first region near said one end of said body to a second region thereof near said other end; said tubular member having a surface in contact with a channel for passing a heat exchange fluid through said body, said channel not being in fluid communication with said electrolyte space.

4,518,478
LIQUEFACTION WITH MICROENCAPSULATED CATALYSTS

Sol W. Weller, Williamsville, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1984, Ser. No. 612,953
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE **14 Claims**

1. In a catalytic solid carbonaceous material liquefaction process, a method of catalyst distribution into said solid carbonaceous material comprising:

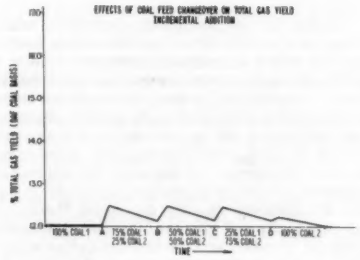
forming a solid suspension in carbonaceous liquid of liquefaction-catalyst-containing microcapsules having thermolabile, polymeric shells and

contacting said solid carbonaceous material with said suspension at a decomposition temperature sufficient to destroy the microcapsule shells and to intimately contact said liquefaction catalyst with said solid carbonaceous material.

4,518,479
TIME PHASED ALTERNATE BLENDING OF FEED COALS FOR LIQUEFACTION

Frank Schweigharett, Allentown; David S. Hoover, New Tripoli, and Diwaker Garg, Macungie, all of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Jun. 19, 1984, Ser. No. 622,374
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE **4 Claims**



1. A hydro-liquefaction process for coals wherein the feedstock changes from a first coal to a second coal through a sequence of time-phase blending in incremental additions of said second feed coal to said first feed coal and wherein process solvent derived from said first coal is incompatible with said second coal by causing an increase in the quantity of hydrocarbon gas make and hydrogen consumption during liquefaction, which process comprises: forming a slurry of finely divided feed coal and process-derived solvent, contacting said slurry with a hydrogen-rich gas, heating said slurry in the presence of said hydrogen-rich gas to react said heated slurry and to dissolve at least some of said coal, adding fresh hydrogen as required to form a liquefied coal slurry, passing said liquefied coal slurry to a separator to separate a vapor product stream and a condensed product stream, passing said condensed product stream to a distillation still and removing therefrom a residual bottoms product stream and a fraction recycled as process-derived solvent, wherein the time-phase blending change-over from said first coal to said second coal is effected by incremental sequential addition to said first coal of said second coal in an amount such that said process-derived solvent at the time of sequential addition is no less than 25% compatible with the feed coal admixture subsequent to said sequential addition of said coals to produce a decreasing level of light hydrocarbon gas production and hydrogen consumption compared with the last incremental admixture of said feed coals and after each of said incremental sequential additions operating said process for a sufficient length of time to permit said compatibility of solvent to coal to approach 100% before the next sequential incremental addition of said second feed coal composition to gradually shift away the characteristics of said process solvent derived from said first coal towards the characteristics of process solvent derived from said second coal.

4,518,480

PROCESS FOR THE EFFICIENT UTILIZATION OF SOLVENT MODIFIED OIL SHALES

Costandi A. Audeh, Princeton, and Thomas O. Mitchell, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,845
Int. Cl.[3] C10G 1/04
U.S. Cl. 208—11 LE 48 Claims

1. A combination solvent extracting and hydroprocessing process for recovering hydrocarbonaceous materials from oil shale comprising the steps of:

(a) treating said oil shale with a hydrogen donor solvent;

(b) extracting said treated oil shale with a paraffinic solvent which has the ability to solubilize some of the hydrocarbonaceous materials, and to selectively leave on said treated shale, residual asphaltenic materials or "paraffinic asphaltenes", which are insoluble in said solvent;

(c) hydroprocessing said solvent containing said solubilized hydrocarbonaceous material;

(d) extracting said treated oil shale with a solvent suitable for solubilizing said asphaltenes remaining on said treated shale;

(e) hydroprocessing said solvent containing said solubilized asphaltenes; and

(f) processing the solvent extracted oil shale to remove any remaining hydrocarbonaceous material therefrom.

4,518,481

PROCESS FOR PRODUCTION OF OXIDATION-RESISTANT HYDROCARBON OIL COMPOSITION, AND OXIDATION-RESISTANT COMPOSITION MADE THEREBY

Pierre D. Marin, Bonsecours, France, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 272,926, Jun. 12, 1981, abandoned.
This application Aug. 10, 1983, Ser. No. 522,046
Claims priority, application United Kingdom, Jun. 17, 1980, 019728
Int. Cl.[3] C10G 71/00, 45/44
U.S. Cl. 208—19 12 Claims

1. A process for producing a hydrocarbon oil composition of igh resistance to oxidation comprising the steps of:

(a) subjecting a hydrocarbon oil basestock boiling in the lube oil temperature range and having an aniline point exceeding 60° C. to a catalytic hydrogen-refining treatment at a temperature in the range of from 300° to 360° C. and at a partial pressure of hydrogen in the range of from 20 to 50 bars to produce a refined basestock having a sulfur content not exceeding 0.10 wt. %;

(b) subjecting an aromatics-rich hydrocarbon fraction obtained by thermal or catalytic cracking of a heavy hydrocarbon feedstock, boiling in the lube oil temperature range and having an aniline point not exceeding 35° C. and a sulfur content of at least 2.0 wt. % to a catalytic hydrogen-refining treatment at a temperature in the range of from 220° to 300° C. and a partial pressure of hydrogen in the range of from 20 to 50 bars to produce a refined fraction having a sulfur content of at least 1.0 wt. %; and

(c) forming a blend comprising 85 to 99.9 wt. % of the said refined basestock and 15 to 0.1 wt. % of said refined fraction.

4,518,482

PITCH FOR DIRECT SPINNING INTO CARBON FIBERS DERIVED FROM A COAL DISTILLATE FEEDSTOCK

Ghazi Dickakian, Greenville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 19, 1982, Ser. No. 399,702
The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.
Int. Cl.[3] C10C 3/00; D01F 9/14
U.S. Cl. 208—22 5 Claims

1. A pitch suitable for carbon fiber manufacture which can be spun directly into pitch fibers, comprising approximately by weight content between 80 and 100 percent toluene insolubles and greater than 15 percent quinoline insolubles, said pitch having been derived, by heat soaking followed by vacuum stripping, from a substantially deasphaltenated fraction of a coal distillate rich in 3, 4, 5 and 6 polycondensed aromatic rings, and wherein said pitch is further characterized as being relatively free of impurities and ash.

4,518,483

AROMATIC PITCH FROM ASPHALTENE FRACTIONS

Ghazi Dickakian, Greenville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1983, Ser. No. 508,183
Int. Cl.[3] C10C 1/20, 1/18, 3/08
U.S. Cl. 208—44 8 Claims

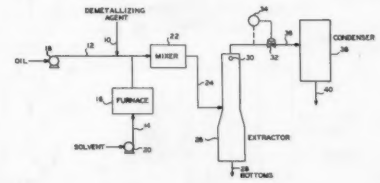
1. A method of preparing a pitch suitable for carbon fibers manufacture consisting essentially of heat-soaking a feed material consisting of a heavy aromatic asphaltene fraction of a heavy aromatic cracked feedstock, said asphaltene fraction having a number average molecular weight of at least 900 and at least 7 polycondensed aromatic rings and is obtained from a petroleum distillate, naphtha or gas oil catalytic or steam cracking residues, at a temperature of about 380°–440° C. for about 1–500 minutes, and then subsequently removing unreacted oils from the heat soaked aromatic asphaltene fraction by vacuum distillation.

4,518,484

METALS REMOVAL WITH A LIGHT HYDROCARBON AND AN ORGANOPHOSPHOROUS COMPOUND

David P. Mann; Simon G. Kukes, and Daniel M. Coombs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1984, Ser. No. 580,997
Int. Cl.[3] C10G 17/02, 21/02
U.S. Cl. 208—87 19 Claims



1. A process for treating and upgrading metal containing hydrocarbon feed streams comprising the steps of:

(a) contacting said feed in an extraction zone with at least one hydrocarbon solvent containing from 2 to 10 carbon atoms per molecule under supercritical separation conditions in the presence of at least one organophosphorus chemical demetallizing agent at an agent to hydrocarbon weight ratio and conditions sufficient to decompose or react with porphyrin and asphaltene compounds of metals present and thereby assist in the removal of metal contaminants from the hydrocarbon feed, and

(b) recovering from said extraction zone an overhead stream comprising hydrocarbons substantially reduced in con-

taminating metals content and a bottoms product comprising solvent and contaminating metals.

4,518,485

HYDROTREATING/ISOMERIZATION PROCESS TO PRODUCE LOW POUR POINT DISTILLATE FUELS AND LUBRICATING OIL STOCKS

Rene B. LaPierre, Medford; Randall D. Partridge, Princeton; Nai Y. Chen, Titusville, and Stephen S. Wong, Medford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 379,422, May 18, 1982, Pat. No. 4,419,220. This application Dec. 2, 1983, Ser. No. 557,696
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.³ C10G *65/12*
U.S. Cl. 208—89 **19 Claims**

1. A process for dewaxing a hydrocarbon feedstock containing paraffins selected from the group of normal paraffins and slightly branched paraffins and sulfur and nitrogen compounds which comprises

(a) subjecting said feedstock to hydrotreating in a hydrotreating zone containing a conventional hydrotreating catalyst operated at a conventional hydrotreating conditions sufficient to remove at least a portion of said sulfur and nitrogen compounds;

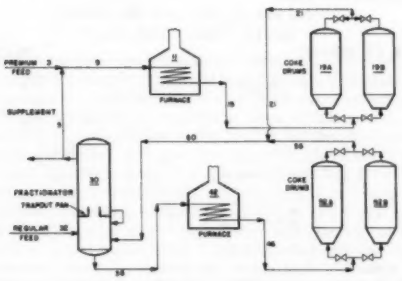
(b) subjecting said hydrotreated feedstock to catalytic dewaxing by contacting said feedstock with a catalyst comprising zeolite beta having a silica/alumina ratio of at least 30:1 and a hydrogenation/dehydrogenation component under isomerization conditions, sufficient to isomerize at least a portion of said normal paraffins and wherein a majority of normal paraffins converted are converted by isomerization.

4,518,486

CONCURRENT PRODUCTION OF TWO GRADES OF COKE USING A SINGLE FRACTIONATOR

John C. Jansma, Middleburg Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 219,651, Dec. 24, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,810
Int. Cl.³ C10G *9/14*
U.S. Cl. 208—131 **7 Claims**



1. A process for the concurrent production of both regular and premium coke using a single fractionator, the process comprising

(a) combining a recycle-free premium feed with a non-coking feed supplement to form a premium coker charge,

(b) heating and introducing the charge to a premium coke drum to form coke and overhead vapors,

(c) operating a single fractionator and withdrawing from it a regular grade coker recycle feed,

(d) heating and charging said regular grade coker feed to a regular coke drum, to form coke and overhead vapors

(e) passing the overhead vapors from both premium and regular coke drums to the fractionator.

4,518,487

PROCESS FOR IMPROVING PRODUCT YIELDS FROM DELAYED COKING

Harlan G. Graf, and Harry R. Janssen, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 519,291, Aug. 1, 1983, abandoned. This application Mar. 19, 1984, Ser. No. 590,607
Int. Cl.³ C10G *9/14*
U.S. Cl. 208—131 **9 Claims**

1. A process for improving the product yields from delayed coking of a heavy hydrocarbon oil feedstock in a coking unit comprising a coker furnace, a coking drum and a coker fractionator to produce delayed coke and cracked liquid and gaseous hydrocarbon products comprising the steps of:

(a) delayed coking said heavy hydrocarbon oil in said coking drum under conditions at which delayed coke having a volatile matter content of not more than 15 percent by weight is produced;

(b) passing overhead vapors from said coking drum to said coker fractionator;

(c) condensing the highest boiling fraction of said overhead vapors and removing said fraction from said process; and

(d) adding a diluent hydrocarbon having a lower boiling range than said highest boiling fraction to said heavy hydrocarbon oil feedstock prior to heating said heavy hydrocarbon oil feedstock to coking temperature in said coker furnace, said diluent hydrocarbon being added in an amount sufficient to effectively prevent coke deposition in said coker furnace, whereby the yield of delayed coke having a volatile matter content of less than 15 percent by weight is lower, and the liquids yield is higher, than the yields which would be obtained if said highest boiling fraction of said overhead vapors were combined with said feedstock.

4,518,488

METAL-CONTAINING ACTIVE CARBON AND METHODS FOR MAKING AND USING SAME

Arnold N. Wennerberg, Chicago, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 470,285, Feb. 28, 1983, Pat. No. 4,482,641. This application Jan. 19, 1984, Ser. No. 572,017
Int. Cl.³ C10G *45/08, 45/50, 47/12, 49/04*
U.S. Cl. 208—216 R **7 Claims**

1. A process for hydrotreating a fossil fuel containing asphaltenes, comprising contacting said fuel with hydrogen under hydrotreating conditions comprising a temperature of

315°–510° C., a pressure of 2.1–71 MPa, a hydrogen rate of 71–1780 m^3/m^3, and a space velocity of 0.2–5 volumes of feed per hour per volume of catalyst, and in the presence of a catalyst comprising a substantially uniform dispersion of a metal or metal oxide in a porous carbon matrix, wherein the dispersed metal and metal in the dispersed metal oxide are each a hydrogenating metal, wherein the weight ratio of the metal- or metal oxide-to-carbon matrix material is from about 1:10,000 to about 1:1, and wherein the catalyst has a cage-like structure, a BET surface area of at least 800 square meters per gram and a bulk density of at least 0.1 gram per cubic centimeter, wherein the dispersion is formed by a process comprising:

forming a uniform co-crystallite from an aromatic carboxylic or sulfonic acid, phenol, thiol, aromatic amine or salt of any thereof and from a salt or complex of a metal from Group VIB or Group VIII of the Periodic Table of Elements;

forming a uniform powdered mixture of the co-crystalline and an alkali metal hydroxide;

pyrolyzing the powdered mixture in an inert atmosphere at a temperature in the range of from about 400° C. to about 980° C. to form the carbon matrix having the metal or metal oxide substantially uniformly dispersed therein; and

separating unreacted inorganic material and inorganic reaction products, other than the dispersed metal or metal oxide from the carbon matrix to form the porous carbon matrix end product.

2. The process of claim 1 wherein the dispersed metal is a Group VIB metal, a Group VIII metal or a mixture thereof and the dispersed metal-containing material is a Group VIB metal oxide or sulfide, a Group VIII metal oxide or sulfide, or a mixture thereof.

3. The process of claim 2 wherein the Group VIII metal is cobalt or nickel.

4,518,489

OIL TREATMENT

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 304,502, Sep. 22, 1981, abandoned. This application Sep. 22, 1982, Ser. No. 421,226

Int. Cl.³ C10G *17/00, 17/04, 17/08*

U.S. Cl. 208—223 **21 Claims**

1. A process for treating hydrocarbon oils in order to separate nitrogenous substances, as well as other contaminants, therefrom which comprises (1) contacting the oil in the presence of water with an acid gas which has an affinity for nitrogenous substances under conditions including temperature in the range of about 20° to about 90° C., sufficient pressure and contacting with an immiscible phase chosen from water, immiscible solvent or mixtures thereof effective to provide removal of nitrogen-containing compounds, and (2) separating said immiscible phase containing nitrogen-containing compounds from the hydrocarbon oils.

4,518,490

REMOVAL OF ARSENIC COMPOUNDS FROM PETROLIFEROUS LIQUIDS

Richard H. Fish, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 6, 1984, Ser. No. 597,627

Int. Cl.³ C10G *25/00*

U.S. Cl. 208—251 R **7 Claims**

1. Process for removing arsenic contaminants from petroliferous liquids by contacting said liquid at a temperature of about 20° C. to about 140° C., with a polystyrene-divinylbenzene polymer crosslinked with up to about 20% divinylbenzene and which polymer contains up to about 30% by weight of catechol ligands.

4,518,491

BENEFICIATION OF CLAYS BY FROTH FLOTATION

Bomi M. Bilimoria, Tennille, and Anthony A. May, Sandersville, both of Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.

Filed Sep. 13, 1982, Ser. No. 417,663

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **12 Claims**

1. A method for removing titaniferrous discoloring contaminants from a kaolin clay, to thereby increase the brightness of said clay, said method comprising:

forming an aqueous dispersion of said clay, and blunging and conditioning said dispersion in the presence of a collector agent for said titaniferrous contaminants, said agent comprising a combination of a complex mixture of a monophosphate ester and a diphosphate ester or salt thereof, of a non-ionic surface active compound, together with oleic acid; wherein said non-ionic surface active compound is the condensation product of an alkyl alcohol having from 8 to 50 carbon atoms with at least one mole of an alkylene oxide having from 2 to 3 carbon atoms and containing a maximum of about 50% by weight alkylene oxide based on the weight of the non-ionic surface active compound; and

subjecting said blunged conditioned slurry to a froth flotation treatment to effect separation with said froth of said collected titaniferrous contaminants.

4,518,492

ORE FLOTATION WITH COMBINED COLLECTORS

Clarence R. Bresson, and Kenneth B. Kimble, both c/o French, Hughes and Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Filed Jun. 15, 1984, Ser. No. 621,337

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **28 Claims**

1. A composition comprising a mixture which contains both of the following compounds in substantial quantities

(a) S-carbalkoxy-S'-alkyl trithiocarbonate; and

(b) n-dodecyl mercaptan.

4,518,493

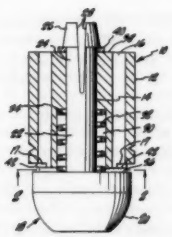
NOISE ATTENUATING FILTER FOR FLUID FLOW SYSTEMS

Edwin T. Badders, 3040 Riverside Dr. Terr., Chino, Calif. 91710

Filed Jan. 11, 1984, Ser. No. 569,845

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—137 **4 Claims**



1. A noise attenuating filter for use in a fluid flow system comprising: a cylindrical body member having a fluid inlet end and a fluid outlet end and defining a central aperture extending axially therethrough, means defining an annular chamber disposed about said aperture, means defining a plurality of fluid

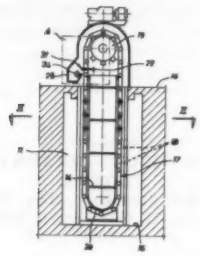
passageways extending axially through said body member externally of said chamber and terminating in a corresponding plurality of axially disposed fluid inlets in the inlet end of said body member and defining a plurality of axially disposed fluid outlets in the outlet end of said body member and defining a corresponding plurality of slots in said fluid inlet end of said body member extending radially from said fluid inlets, the cross-sectional area of each of said slots being less than the cross-sectional area of each of said fluid inlets and defining means for filtering said fluid to prevent objects larger than said slots from passing therethrough, a closing member having a stem portion and a head portion, said stem portion extending through the central aperture in said body member and said head portion extending over the fluid inlet end of said body member and being adapted to seal said fluid inlets; means carried by said body member for maintaining said stem portion of said closing member within said aperture in said body member; and means disposed within said annular chamber in said body member for biasing said head portion of said closing member from said fluid inlet end of said body member, said inlets, passageways, outlets and said closing member defining means for reducing noise by allowing fluid in said system to flow about said head portion into said fluid inlets, through said fluid passageways and out said fluid outlets and upon said head portion of said closing member being pressed into sealing engagement with said fluid inlet end of said body member, the fluid flows into said fluid passageways through said radial slots.

4,518,494

CLEANING DEVICE FOR INDUSTRIAL WATER INTAKES

Philip Jackson, Paris, France, assignor to E. Beaudrey & Cie, Paris, France

Filed Apr. 7, 1983, Ser. No. 482,795
Claims priority, application France, Apr. 8, 1982, 82 06209
Int. Cl.³ B01D *33/02*
U.S. Cl. 210--158 **15 Claims**



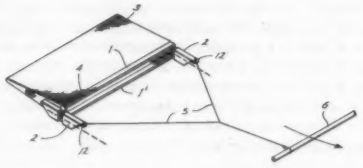
1. In an industrial water intake of the type comprising a screen for screening water containing debris adapted to be deposited on said screen in the course of operation, spray means for detaching debris from said screen arranged on one side thereof, a debris recovery channel arranged below said spray means for detaching debris from said screen and on the other side of said screen from said means for collecting debris detached from said screen and for carrying the debris away from said water intake, said debris recovery channel having a longitudinal edge relatively adjacent to said screen, wherein the improvement comprises a cylindrical rotary member disposed adjacent to and extending along the entire longitudinal edge of said debris recovery channel, at least a portion of said rotary member extending above said longitudinal edge of said debris recovery channel, means for rotating said rotary member in a direction to carry debris falling toward said longitudinal edge away from said longitudinal edge and into said debris recovery channel thereby preventing the build-up of debris on said longitudinal edge.

4,518,495

POOL SKIMMER

Henry W. Harding, 6666 Harwin, Suite 400, Houston, Tex. 77036

Continuation-in-part of Ser. No. 419,586, Sep. 17, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 577,994
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **7 Claims**



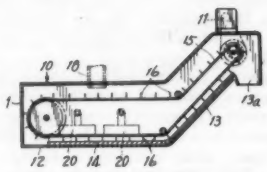
7. A pool skimmer having an open framework of framework members, the framework members having laterally extended end members, floats releasably mounted on the respective ends of said framework members, said floats having means defining vertical grooves midway the longitudinal ends thereof to receive said end members and means defining transverse ports forming horizontal passageways through said grooves to receive fastening means and means mounting an open end of a net on said framework and maintaining the net partially submerged.

4,518,496

LIQUID BRANCH FLOW GUIDE CONDUIT ASSEMBLY FOR USE IN A MAGNETIC APPARATUS FOR SEPARATING FOREIGN MATTERS FROM WASTE LIQUIDS CONTAINING THE FOREIGN MATTERS

Minoru Kanekubo, 1012-3 Sugito, Sugito-Machi, Kitakatsushika-Gun, Saitama-Ken, Japan

Filed Jan. 5, 1983, Ser. No. 455,896
Int. Cl.³ B03C *1/16*
U.S. Cl. 210—222 **1 Claim**



1. A magnetic apparatus for separating magnetic foreign matter from waste liquids containing the foreign matter, comprising:

means defining an elongated treating chamber;

an endless chain conveyor mounted in said treating chamber and extending in a closed loop therein with upper and lower runs and having a plurality of spaced flight bars extending outwardly from the conveyor;

a magnet plate along the inner surface of the bottom of said treating chamber, the lower run of said conveyor extending along said magnet plate with said flight bars frictionally engaging said magnet plate; and

at least one liquid branch flow guide assembly having an imperforate flat base positioned between said runs and spaced slightly above said lower run of said conveyor and having a raised center portion defining an unobstructed recess opening out of the undersurface of the center of said base and having a first center opening in said center portion opposite the position where the recess opens out of the base, a pipe support member on said base surrounding said center raised portion and extending up and over

and in spaced relationship to said raised center portion and having a second center opening, a drain pipe having an upright portion extending from said first center opening through said second center opening and opening at the lower end into said first center opening into said raised portion, said pipe having an elbow portion connected to the upper end of said upright portion and a horizontal drain portion connected to said elbow portion and extending out of said treating chamber, a flow passage being defined between said flat base and said magnet plate having an inlet opening around the periphery of said flat base between said flat base and said magnet plate and an outlet to said flow passage constituted by said drain pipe, for, when liquid flows out of said drain pipe, the liquid in said treating chamber is caused to flow between said flat plate and said magnet plate to conduct the liquid over the magnet plate for allowing the magnetic attraction of the magnet plate to be exerted on the magnetic foreign matter in the liquid before the liquid reaches said recess.

4,518,497

BLOOD TREATING SYSTEM

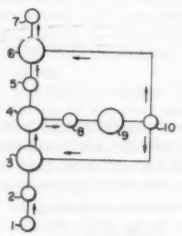
Nobuaki Tsuda; Naoya Kominami; Kenji Inagaki, and Tamotsu Imamiya, all of Fujishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 968,914, Dec. 13, 1978, Pat. No. 4,243,532, which is a continuation of Ser. No. 726,193, Sep. 24, 1976, abandoned. This application May 15, 1980, Ser. No. 150,070

Claims priority, application Japan, Sep. 26, 1975, 50-115662; Mar. 29, 1976, 51-33562

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—259 **6 Claims**



1. A blood treating system comprising:

a blood introducing port;

a blood-plasma separating element having an inlet connected to the blood introducing port, membrane means for separating plasma from blood which does not pass any blood corpuscle therein, a concentrated blood outlet and a plasma outlet;

means for treating plasma connected to the plasma outlet having a purified-plasma outlet;

an element interconnecting the concentrated blood outlet and the purified-plasma outlet for mixing the concentrated blood with the purified plasma;

a purified blood withdrawing port connected to said element; wherein said means for treating plasma comprises:

a plasma pump connected to the plasma outlet;

means for purifying plasma connected to the plasma pump, said means for purifying comprising a main body, purifying agent for removing unnecessary substances from the plasma filled in the main body, an inlet filter and an outlet filter capable of preventing the purifying agent from flowing out.

4,518,498

METALLURGICAL SLAG FILTERING APPARATUS WHICH EFFECTS UNIFORM CHARGING OF A CONVEYER BELT

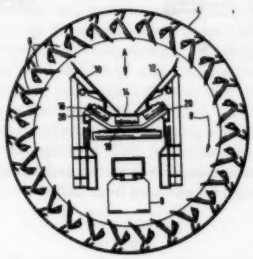
Guido Monteyne, Lembeke, Belgium, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Feb. 10, 1984, Ser. No. 578,816

Claims priority, application Luxembourg, Feb. 10, 1983, 84644

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—297 **2 Claims**



1. Filtration apparatus including a rotary drum, said drum having foraminous walls along the outside surface thereof, said rotary drum having a plurality of internal vanes for filtering liquid and solid materials, said filtered solid material being conveyed upwardly and subsequently falling onto a conveyer belt passing longitudinally through the drum, said filtration apparatus further including:

at least a pair of deflector means, said deflector means being disposed above said conveyor belt and extending in the direction of travel of said conveyor belt;

said pair of deflector means defining a space therebetween wherein said filtered solid material is guided onto said belt;

at least part of said deflector means diverging in the direction of the movement of said conveyor belt; and

said rotary drum being divided into a plurality of sections, each of said sections having plural vanes therein, wherein said vanes of each of said sections are angularly offset relative to said vanes of adjacent sections.

4,518,499

APPARATUS FOR FRACTIONATING SOLID PARTICLES SUSPENDED IN A LIQUID

Bernard Perrin, Grenoble; Bernard Bianchin, Seyssinet, and Georges Sauret, Grenoble, all of France, assignors to Centre Technique de L'Industrie des Papiers, Cartons et Celluloses, Grenoble, France

Division of Ser. No. 284,823, Jul. 20, 1981, Pat. No. 4,477,359. This application May 4, 1984, Ser. No. 607,140

Claims priority, application France, Jul. 25, 1980, 80 16756

Int. Cl.³ B01D *35/20*

U.S. Cl. 210—332 **8 Claims**

1. Equipment for fractionating solid particles suspended in a liquid, comprising:

a feed conduit for a liquid suspension to be treated; an extraction means for filtrate;

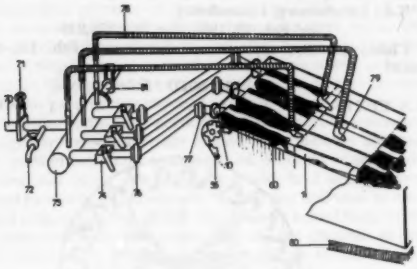
a means for recovering a solid particle concentrated fraction;

a filtering screen comprising an elastically deformable, flexible, perforated sleeve, connected at one end to said feed conduit and at an opposite end to said recovering means;

a means capable of directing the flow of suspension to be treated in a direction parallel to the longitudinal axis of said filtering screen; and

a means capable of locally and substantially deforming said sleeve by moving along the generatrix of said sleeve an

element disposed outside said sleeve, thereby creating respectively before and after said deformation high and



low pressure regions which travel along said sleeve for detaching said particles from said sleeve.

4,518,500

APPARATUS FOR TREATING A FIBROUS MATERIAL

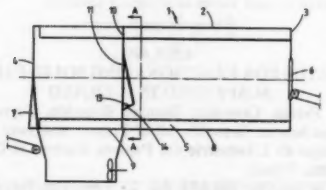
Seppo Vireä, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jan. 25, 1984, Ser. No. 573,858

Claims priority, application Finland, Feb. 1, 1983, 830340

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—380.3 **8 Claims**



1. An apparatus for continuously fiberizing and screening coarse fibrous material to separate the coarse material therefrom which comprises a rotatable drum having an inlet at one end thereof for the material to be treated, an outlet at the opposite end thereof for discharging the separated coarse material, a mantle for the drum which is non-perforated at the inlet end and is perforated at the outlet end, at least one partition wall having an opening, said drum having a longitudinal axis, the partition wall being perpendicular to said longitudinal axis, the partition wall forming a sill over which the material is lifted, a lifting member connected to said partition wall, said lifting member having a lifting capacity, said lifting member lifting the material on the bottom of said non-perforated end for transporting the material to the perforated outlet end, through said opening, said lifting member having means for adjusting the effective capacity of said lifting member and means for locking the lifting member in a desired position.

4,518,501

FLUSH-BACK FILTER

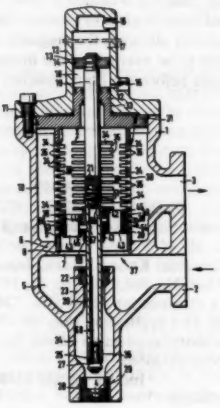
Rüdiger Lennartz, Pulheim; Willi Rott, Bornheim, and Heinz Sindorf, Rommerskirchen, all of Fed. Rep. of Germany, assignors to Firma Boll & Kirch, Filterbau GmbH, Kerpen, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,725

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235552

Int. Cl.³ B01D *35/16*

U.S. Cl. 210—411 **18 Claims**

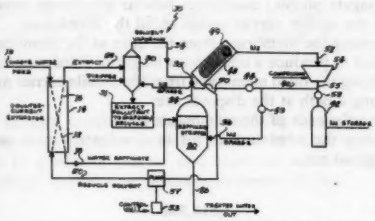


1. A flush-back filter comprising: a filter housing having an interior filter chamber fluidly communicating with a filter inlet, a filter outlet and a sludge drain, the filter outlet and the sludge drain being at a differential pressure; a cylindrical support cage in the filter chamber separating the fluid outlet from the fluid inlet and the sludge drain; filter means surrounding the exterior of the support cage for filtering liquid media penetrating the support cage from the fluid inlet to the fluid outlet; flush-back means movably disposed interior of the support cage for traversing the inner surface thereof; at least two groups of slots formed in the support cage, the slots of each group being separated by corresponding webs along the interior surface traversed by the flush-back means; the slots of one group lying in the plane of the webs of the other group; channel means formed in the exterior surface of the flush-back means fluidly communicating with the sludge drain and alternately registering with the slots and the webs of each of said groups as the flush-back means traverses the interior surface of the support cage, the arrangement being such that the channel means simultaneously register with a slot of one of the groups and a web of the other of the groups during movement of the flush-back means whereby at any one time liquid media is reversely flushed by said pressure differential from the filter outlet through just one of the slots into said channel means and into the sludge drain with individual slots of the two groups being alternately flushed during the traverse of the flush-back means thereby progressively clearing the interior surface of adhering impurities with small flush-back volumes and with low pressure drops.

4,518,502
METHOD OF EXTRACTING ORGANIC CONTAMINANTS FROM PROCESS WATERS

Eugene A. Burns, Solana Beach, and Bruce N. Colby, Carlsbad, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Nov. 4, 1981, Ser. No. 318,106
Int. Cl.³ B01D 11/04
U.S. Cl. 210—634 22 Claims



20. A method of reducing the concentration of an organic contaminant which has a boiling point greater than about 120° C. and which represents an environmental hazard even at concentrations below about 100 ppm in process water to within environmentally acceptable limits comprising

contacting a first stream of process water with a countercurrent second stream of high-boiling, water-immiscible organic solvent to extract said contaminant from said water with said high-boiling solvent, said contaminant being at least about 5 times more soluble in said high-boiling solvent than in water, the volume of said stream of solvent being about 15% or less of the volume of said stream of process water;

contacting said high-boiling solvent-contacted water with a countercurrent third stream of low-boiling, water-immiscible solvent having a boiling point below about 70° C. and at least about 50° C. lower than the boiling point of said high-boiling solvent to extract dissolved high-boiling solvent therefrom;

sparging said low-boiling solvent from said third stream with a gas stream to vaporize said low boiling solvent from said extracted contaminant;

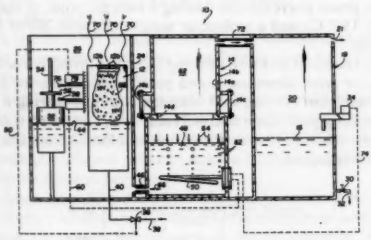
condensing said low-boiling solvent vapor; and

returning said condensed low-boiling solvent to said low-boiling countercurrent stream.

4,518,503
WATER PURIFICATION METHOD AND DEVICE

Saul Fermaglich, Woodcliff Lake, N.J., assignor to Intercontinental Water Corp., Norwood, N.J.

Filed Mar. 29, 1984, Ser. No. 594,926
Int. Cl.³ C02F 9/00
U.S. Cl. 210—662 12 Claims



1. A method of separating by evaporation hydrocarbons from drinking water using a heated activated carbon filter comprising the steps of establishing communication through a fluid connection between an evaporator closed to atmosphere and a compartment having said activated carbon filter, flowing under pressure said drinking water through said activated carbon filter and from thence in a first direction through said fluid connection from said activated carbon filter compartment into said closed evaporator, causing by evaporation in said closed evaporator the production of steam from said drinking water which is partially channelled into a condenser for a phase change back to fluid incident to being used as purified drinking water, allowing a remaining portion of said produced steam in said closed evaporator to force the heated drinking water therein to flow in a reverse second direction through said fluid connection from said closed evaporator back into said activated carbon filter compartment for establishing physical contact with the exterior of said activated carbon filter, and causing by heat exchange between said back flowing heated drinking water and said activated carbon filter the heating of said filter, whereby said drinking water being forced under pressure through said filter is exposed to said heated activated carbon which enhances the filtering of hydrocarbons therefrom.

4,518,504
TREATMENT OF CONTAMINATED STRETFORD SOLUTION

Richard A. Wolcott, Richwood, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 300,085, Sep. 8, 1981, Pat. No. 4,385,044. This application Mar. 11, 1983, Ser. No. 474,403
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ B01D 15/00
U.S. Cl. 210—670 10 Claims

1. A method for removing anthraquinone disulfonate values from an alkaline Stretford Process solution,

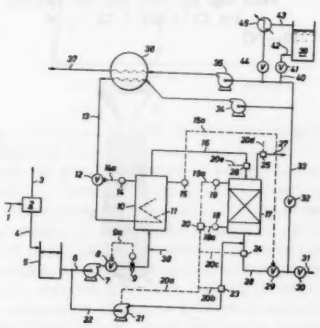
said method comprising contacting said Stretford Process solution with activated carbon which takes up anthraquinone disulfonate values, and

removing said Stretford Process solution from said activated carbon, leaving anthraquinone disulfonate values in said activated carbon.

4,518,505
THERMAL SOFTENING PROCESS

Git B. Lim, and A. Riza Konak, both of Calgary, Canada, assignors to Exxon Production Research Co., Houston, Tex.

Filed May 9, 1983, Ser. No. 492,841
Int. Cl.³ C02F 1/52, 1/66
U.S. Cl. 210—712 18 Claims



1. In a process for heating and softening hard water contain-

ing divalent metal ion scale-forming constituents and bicarbonate ions, the steps comprising:

(a) flowing said hard water into a reaction zone;

(b) directly sparging steam into said water in said reaction zone to predominantly condense said steam in said water and heat said water to a temperature within the range of 150° C. to 250° C. whereby said bicarbonate ions are converted into carbonate and hydroxyl ions which react with the divalent metal ions, whereby a substantial portion of the divalent metal ions are precipitated as calcium carbonate and magnesium hydroxide scale;

(c) maintaining a pressure on said reaction zone which is sufficient to prevent boiling of the water at said temperature;

(d) maintaining the pH of said hard water leaving the reaction zone at a value of at least about 8.5;

(e) withdrawing heated water from said reaction zone;

(f) filtering scale from said heated water at a pressure sufficient to prevent boiling of the heated water;

(g) controlling the pressure difference and temperature difference between the reaction zone and the filtering step so that the pressure difference is no greater than 30 psi and the temperature difference is no greater than 10° C.;

(h) heating a portion of said filtered heated water to produce steam; and

(i) utilizing said steam in sparging step (b) above.

4,518,506

METHOD FOR TREATING THE UPPER LAYER OF A BODY OF WATER

Arthur A. Green, 30 Oak St., Stamford, Conn. 06905, and Robert H. Black, 63 Linwood Rd., New Rochelle, N.Y. 10804

Filed Jan. 3, 1983, Ser. No. 454,969

Int. Cl.³ C02F *1/68*

U.S. Cl. 210—747 **9 Claims**

9. A method for treating the upper layer of a body of water to effect a chemical change within said upper layer, comprising placing a composition comprising an expanded silicate aggregate which is impregnated with up to about 95% by weight of the total composition of at least one chemical water treating agent onto the surface of said body, and allowing said composition to float upon said surface releasing said water treating agent until said water treating agent has diffused into said layer of water and affected said change by chemical reaction.

4,518,507

METHOD FOR CHEMICALLY SOLIDIFYING AND ENCAPSULATING HAZARDOUS WASTES IN ONE CONTINUOUS OPERATION

Jesse R. Conner, Atlanta, Ga., assignor to Chem-Technics, Inc., Atlanta, Ga.

Filed Sep. 13, 1983, Ser. No. 531,750

Int. Cl.³ C02F *1/52, 11/14*

U.S. Cl. 210—747 **7 Claims**

1. A method of treating aqueous liquid and semi-liquid wastes to render them fit for ultimate disposal in a sedentary mass in a landfill or other ultimate disposal site, comprising the steps of:

admixing with the waste a solidification agent in a location proximate an ultimate disposal site;

providing at the ultimate disposal site a mobile carrier means for receiving the admixture of waste and solidification agent and for disposing of the admixture at the disposal site;

feeding the admixture prior to the solidification thereof axially into the hollow cylindrical core of a supply of elongate pliable, continuous tubular membrane mounted on the mobile carrier means to fill the membrane;

dispensing the membrane from the core as the membrane is filled to produce a continuous length of filled membrane;

disposing the filled membrane from the mobile carrier means along a path at the disposal site;

sealing the ends of the membrane; and

allowing the admixture to set to a sedentary mass at the disposal site.

4,518,508

METHOD FOR TREATING WASTES BY SOLIDIFICATION

Jesse R. Conner, Atlanta, Ga., assignor to SolidTek Systems, Inc., Morrow, Ga.

Continuation of Ser. No. 510,152, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 339,621, Jan. 15, 1982, abandoned. This application May 3, 1984, Ser. No. 606,852

Int. Cl.³ C02F *11/14;* C04B *31/00*

U.S. Cl. 210—751 **13 Claims**

1. A method of treating a batch of aqueous liquid and semi-liquid wastes to render them fit for ultimate disposal in a sedentary mass, comprising the steps of:

premixing a solidification agent by admixing cement, a dry water absorbent clay having fine particles, said particles having high surface area, and a powdered alkali metal silicate, wherein said solidification agent has a ratio of cement to clay between about 1:19 and about 47.5:1, a ratio of cement to alkali metal silicate between about 2:1 and about 2000:1, and a ratio of alkali metal silicate to clay between about 1:3,800 and about 3:1;

treating the batch of waste by admixing the premixed solidification agent with the waste in a quantity sufficient to convert the mixture into a chemically and physically stable solid product substantially insoluble in water and which contains substantially no free-standing water; and allowing the admixture to set to a sedentary mass.

4,518,509

PARTICULATE COMPOSITIONS

Michael E. Newberry, Chesterfield, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 9, 1982, Ser. No. 366,947

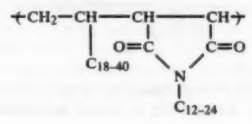
Int. Cl.³ E21B *37/06*

U.S. Cl. 252—8.3 **13 Claims**

1. A composition of matter comprising solid mixture of:

(1) a linear polyethylene having a melting point of about 50° to 150° C., and a molecular weight of about 200 to 10,000, and

(2) a chemical additive selected from the group consisting of pour point depressants and paraffin inhibitors for a waxy petroleum system, said chemical additive having a lower melting point than said polyethylene, and being a copolymer wherein the recurring unit is selected from the group consisting of



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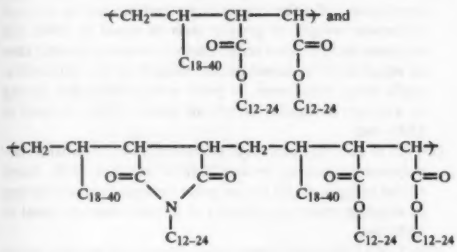


said mixture capable of slowly dissolving in the petroleum system at a temperature of above about 80° C. at a rate sufficient to gradually release said chemical additive into said petroleum system over an extended period of time.

4,518,510

DRILLING MUD DISPERSANTS

Patricia A. Gleason, Westfield, and Ingrid E. Brase, Plainsboro, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 5, 1983, Ser. No. 558,131

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 C **18 Claims**

1. An improved aqueous subterranean drilling mud composition comprising a colloidal material suspended in an aqueous medium and a dispersant therefor, wherein the improvement comprises as the dispersant, the presence of 0.1 to 25 ppb. of a water soluble sulfonated vinyl toluene-maleic anhydride copolymer or salt thereof, the copolymer having a molar ratio of vinyl toluene to maleic anhydride of about 1:1 to less than about 2:1, a molecular weight of about 1,000 to 25,000 and at least about 0.7 sulfonic acid groups per vinyl toluene unit, the mud being characterized by improved high temperature and high pressure stability.

4,518,511

DELIVERY OF POLYMERIC ANTIPRECIPITANTS IN OIL WELLS EMPLOYING AN OIL SOLUBLE CARRIER SYSTEM

Ernest D. Kaufman, North Yorkshire, and Robin W. Dexter, Yorkshire, both of England, assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 31, 1980, Ser. No. 202,859

Claims priority, application United Kingdom, Nov. 21, 1979, 7940179

Int. Cl.³ E21B *37/00, 41/02*

U.S. Cl. 252—8.55 B **3 Claims**

1. A water-in-oil emulsion polymeric composition adapted for use to prevent corrosion or scaling in deep oil well-bores comprising in combination:

(a) from 1 to 60 parts by weight of water-soluble maleic acid, allyl sulfonic acid copolymer having a molecular weight ranging between about 500 and about 25,000 in the presence of sufficient water to attain a saturated solution of the above defined polymer,

(b) from 20 to 70 parts by weight of a hydrocarbon oil, and

(c) from 1 to 20 parts by weight of a mixture of surfactants one of which having a hydrophile lipophile balance (HLB) value less than 8 and the other having a HLB value greater than 10 wherein the combined HLB value of the surfactants are in the range of 5 to 12.

4,518,512

WATER-CONTAINING LUBRICANT

Hideo Kanamori, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,382

Claims priority, application Japan, Dec. 29, 1982, 57-229831

Int. Cl.³ C10M *1/06*

U.S. Cl. 252—49.5 **4 Claims**

1. A water-containing lubricant comprising per 100 parts by weight of a lubricating base oil, from 0.1 to 20 parts by weight of a water-soluble corrosion inhibitor and from 1 to 1,000 parts by weight of water dispersed in the base oil by the use of a surfactant mixture, said surfactant mixture consisting essentially of

(1) from 2 to 80 parts by weight of a nonionic surfactant selected from the group consisting of an ester of fatty acid and polyhydric alcohol, or polyoxyalkylene type compound, aliphatic alcohol having from 7 to 30 carbon atoms and fatty acid having from 7 to 30 carbon atoms, having a hydrophile lipophile balance (HLB) value of less than 6,

(2) from 2 to 80 parts by weight of a nonionic surfactant which is an ester of fatty acid and polyhydric alcohol, or a polyoxyalkylene type compound, having a HLB value of from 6 to less than 11,

(3) from 2 to 80 parts by weight of a nonionic surfactant which is an ester of fatty acid and polyhydric alcohol, or polyoxyalkylene type compound, having a HLB value of from 11 to less than 20, and

(4) from 0.5 to 80 parts by weight of an ionic surfactant selected from the group consisting of metal salts of fatty acid having from 7 to 18 carbon atoms, metal salts of naphthenic acid, esters of alkyl sulfates and alkyl sulfonates, having a HLB value of not less than 15.

4,518,513

PASTY DAMPING MEDIUM METHOD FOR PREPARING AND USING SAME

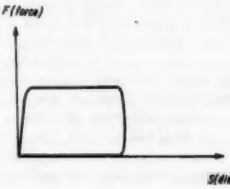
Kaspar Lochner, Munich; Helmut Schürmann, Dachau, and Erich Brand, Munich, all of Fed. Rep. of Germany, assignors to Schiedel GmbH & Co., Munich, Fed. Rep. of Germany

Division of Ser. No. 441,513, Nov. 3, 1982,. This application Mar. 2, 1984, Ser. No. 585,463

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ C04B *43/00;* C10M *5/04*

U.S. Cl. 252—62 **12 Claims**



1. A pasty damping medium for damping mechanical and/or acoustic vibrations, comprising, as a liquid phase, a member selected from the group consisting of polyglycols and saturated aliphatic or aromatic carboxylic acid esters stable to temperature fluctuation, and about 20 to 80% by weight based on the total weight of the damping medium of particles of a solid selected from the group consisting of aluminum oxide, aluminum silicate, aluminum phosphate, aluminum polyphosphate, cryolite, calcium phosphate, calcium fluoride, magnesium oxide, magnesium silicate; magnesium aluminum silicate, molybdenum sulfide, silicon dioxide, sillimanite, titanium dioxide, zinc sulfide and zinc pyrophosphite, at least 80% of said particles having a particle size of less than 10 μm.

4,518,514

HEAT STORAGE MATERIAL

Hideaki Kamohara, Ibaraki; Michio Yanadori, Hachioji; Seigo Miyamoto, Takahagi, and Keiichi Koike, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,271

Claims priority, application Japan, Apr. 16, 1982, 57-62406; Nov. 22, 1982, 57-203614

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—70 **11 Claims**

1. A heat storage material consisting essentially of pure or industrial grade acetic acid or a mixture of pure or industrial grade acetic acid and one or more acetates, and at least one anhydrous halide of a substance selected from the group consisting of calcium, strontium, barium, potassium and ammonium as a nucleating agent; the amount of the anhydrous halide in the heat storage material being 0.005 to 10% by weight.

4,518,515

MOULDING COMPOSITIONS OF VINYL CHLORIDE POLYMERS, GRAFT POLYMERS AND POLYMERIC PLASTICIZERS HAVING A HIGH RESISTANCE TO AGEING

Karl-Heinz Ott, Leverkusen; Christian Lindner, Cologne; Walter Uerdingen, Leverkusen; Hans-Eberhard Braese, Cologne, and Helmut Hurnik, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,633

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229078

Int. Cl.³ C08L *27/06, 31/04, 51/04, 52/02*

U.S. Cl. 525—79 **2 Claims**

1. A thermoplastic molding composition comprising from 25 to 50 parts (A), from 25 to 50 parts (B), from 0 to 10 parts (C), from 5 to 40 parts (D) and from 3 to 30 parts (E), where all parts are by weight of the molding composition, and where:

(A) is a polymer containing at least 50%, based on the weight of (A), of vinyl chloride;

(B) is a mixture comprising 20% to 100%, based on the weight of (B), of (B) (1) and from 0% to 80%, based on the weight of (B), of (B) (2); wherein (B) (1) is a graft product comprising a monomer grafted onto a substrate in a ratio of monomer to substrate of from 1:10 to 10:1, and where the monomer is from 0% to 75%, based on the weight of the monomer, of (meth) acrylonitrile and from 100% to 25%, based on the weight of the monomer, of styrene, p-methyl styrene, alpha-methyl styrene, methyl methacrylate or combinations thereof; and the substrate is selected from a first rubber polymer comprising from 60% to 100%, based on the weight of the first rubber polymer, of a first acrylic ester where said first acrylic ester is an acrylic ester of an alcohol having from one to ten carbon atoms; from 0% to 40%, based on the weight of the first rubber polymer, of acrylonitrile, methyl methacrylate, vinyl acetate, vinyl ether or combinations thereof; and from 0% to 10%, based on the weight of the first rubber polymer, of a cross-linking bifunctonal or polyfunctional monomer or polymer; and

a second rubber polymer comprising an ethylene/propylene terpolymer rubber; and wherein (B) (2) is a copolymer consisting of from 0% to 75%, based on the weight of (B) (2), of (meth) acrylonitrile and from 100% to 25%, based on the weight of (B) (2), of styrene, alphamethyl styrene, p-methyl styrene, methyl methacrylate or combinations thereof;

(C) is a resin-like, thermoplastic copolymer of styrene and acrylonitrile or methyl methacrylate and acrylonitrile where component (C) has a Staudinger index value which is greater than or equal to 3 dl/g and which is higher than the Staudinger index value of component (B);

(D) is a copolymer selected from the group consisting of (D) (1), (D) (2), (D) (3) and any combination thereof where

(D) (1) is selected from the group consisting of ethylene/vinyl acetate copolymers containing greater than or equal to 50%, based on the weight of the ethylene/vinyl acetate copolymer, of polar components and having an average molecular weight of greater than or equal to 1500; and ethylene/acrylic ester copolymers containing greater than or equal to 50%, based on the weight of the ethylene/acrylic ester copolymer, of polar components and having an average molecular weight of greater than or equal to 1500; and

(D) (2) is an ethylene/vinyl acetate/carbon monoxide terpolymer containing greater than or equal to 20%, based on the weight of (D) (2), of polar components and having an average molecular weight of greater than or equal to 1500; and

(D) (3) is a copolymer comprising: from 10% to 99%, based on the weight of (D) (3), of an acrylic ester of an alcohol containing one to fifteen carbon atoms; from 0% to 90%, based on the weight of (D) (3), of at least one bifunctional or polyfunctional monomer containing conjugated or unconjugated double bonds; and

from 0% to 40%, based on the weight of the sum of (D) (1) and (D) (2), of acrylonitrile, vinyl acetate, methacrylic acid alkyl esters of alcohols having from one to eight carbon atoms or combinations thereof, average molecular weight of greater than or equal to 1500; and

(E) is a copolymer comprising (E) (1), (E), (2) or combinations thereof where

(E) (1) is a copolymer comprising from 60 to 95%, based on the weight of (E) (1), of a monomer containing 2 conjugated olefinic double bonds or a second acrylic ester where said second acrylic ester is an acrylic ester of an alcohol containing one to six carbon atoms or mixtures thereof; from 5 to 40%, based on the weight of (E) (1), of styrene, acrylonitrile, methacrylic acid methyl ester or combinations thereof; and

from 0 to 10%, based on the weight of (E) (1), of a cross-linked bifunctional or polyfunctional monomer or polymer containing conjugated double bonds; from 0% to 30%, based on the weight of (E) (1) of vinyl acetate, acrylic acid, methacrylic acid, vinyl ethers or combinations thereof;

where (E) (1) has a gel content of greater than or equal to 70% and where (E) (1) is different from (D) (3) in at least one parameter; and

(E) (2) is an ethylene/propylene terpolymer rubber having a gel content of greater than or equal to 70%.

4,518,516

SODIUM METASILICATE PARTICULATES AND DETERGENT COMPOSITIONS COMPRISED THEREOF

Gerard Godard, Chateau Thierry; Daniel Joubert, Trevoux, and Philippe Gagnaire, Charly/sur/Marne, all of France, assignors to Rhone-Poulenc Chimie De Base, Courbevoie, France

Filed Jul. 11, 1983, Ser. No. 512,888

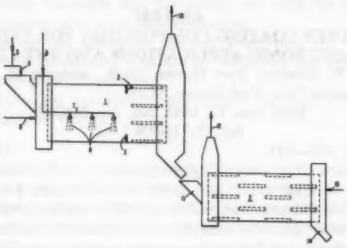
Claims priority, application France, Jul. 9, 1982, 82 12068

Int. Cl.³ C11D *17/06*

U.S. Cl. 252—91 **25 Claims**

1. Granular particulates of sodium metasilicate, said particulates comprising a central core of essentially anhydrous sodium metasilicate and a core-enveloping sheath of sodium metasili-

cate pentahydrate therefor, the granular particulates comprising from 73 to 88% by weight of sodium metasilicate and from



10 to about 25% by weight of water, and having an apparent volume ranging from about 1.05 to about 1.20 g/cm^3.

4,518,517

NON-ANTIMICROBIAL DEODORANT CLEANSING COMPOSITION

Edward Eigen, East Brunswick; David Z. Twersky, and Dina I. Brachman, both of Highland Park, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,817
Int. Cl.^{3} C11D *3/48, 9/50*
U.S. Cl. 252—107 16 Claims

1. A deodorant body cleansing composition comprising at least one carbohydrate selected from the group consisting of glucose, mannose and oligomers thereof as the essential deodorant agent in an amount of about 2.5–10%, effective to reduce the odor-causing bacterial population on the body, without the use of antimicrobials, in an anionic detergent-containing vehicle.

4,518,518

COLD PAINT STRIPPING COMPOSITION

Robert W. Koch, Norristown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 480,345, Mar. 30, 1983, abandoned. This application Feb. 14, 1984, Ser. No. 580,034
Int. Cl.^{3} B08B *3/04;* C09D *9/00;* C11D *7/50;* C23G *5/02*
U.S. Cl. 252—142 29 Claims

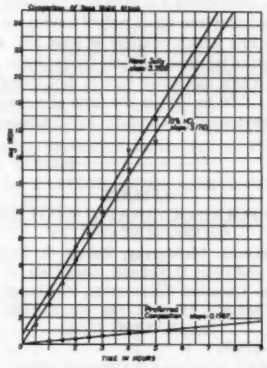
1. An aqueous film removing composition comprising:
(a) from about 5 to about 12.5 wt. % of at least one chloroacetic acid;
(b) from about 5 to about 15 wt. % of at least one chlorinated C_1–C_3 hydrocarbon;
(c) from about 5 to about 11 wt. % of at least one anionic sulfonate;
(d) from about 0.05 to about 2.5 wt. % of naphthenic acid;
(e) from about 0.5 to about 3.5 wt. % of at least one sorbitan C_{12}–C_{18} ester;
(f) from 0 to about 4 wt. % formic acid;
(g) from 0 to about 2 wt. % of a metal corrosion inhibitor;
(h) from 0 to about 10 wt. % of tetrahydrofuran;
(i) from 0 to about 2.5 wt. % paraffin wax; and
(j) water;
wherein the wt. % values are based on the total weight of the aqueous film removing composition.

4,518,519

ACID BASED VARIABLE VISCOSITY COMPOSITIONS SUCH AS CORROSION AND GREASE REMOVERS AND POLISHES

Peter F. Lott, 5414 Holmes St., Kansas City, Mo. 64110, and Reiner E. Jargosch, 5401 Brookside Blvd., #203, Kansas City, Mo. 64112

Continuation of Ser. No. 289,188, Aug. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 254,896, Apr. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 233,945, Feb. 12, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,663
Int. Cl.^{3} C11D *7/08, 7/34*
U.S. Cl. 252—148 16 Claims



1. A metal cleaning composition comprising a flowable, single phase system of water, from about 5 to 37% by weight of an acid selected from the group consisting of hydrochloric, sulfuric, phosphoric, nitric and mixtures thereof, and from about 0.5 to 5% by weight of polyvinylpyrrolidone, said flowable composition being characterized by the properties of penetrating and removing corrosion from metallic surfaces while inhibiting base metal attack against such metallic surfaces.

4,518,520

CLEANER HAVING IMPROVED DISSOLUTION TIME AND CLARITY AND IMPROVED OF PREPARATION

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 22, 1983, Ser. No. 487,489
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.^{3} C11D *17/00*
U.S. Cl. 252—174.23 18 Claims

1. An improved effervescent cleansing composition in tablet form comprising:
(a) about 20% to about 45% by weight of the final composition of a phosphate salt;
(b) an improved perborate salt mixture wherein the improvement comprises a combination of anhydrous perborate and monohydrate perborate in the amount of about 50% to about 70% by weight of the total cleansing composition, wherein the combination includes at least 20% by weight of the total cleansing composition of anhydrous perborate, said combination having a portion present in a compacted, granulated mixture with from about 0.01% to about 0.70% by weight of said combination of a polymeric fluorocarbon, said cleansing composition being capable of thoroughly cleansing stained surfaces within a soaking time of about five minutes when dissolved in aqueous solution.

4,518,521

HOMOGENEOUS, STORAGE-STABLE POLYOL COMPOSITIONS OF HIGH ETHYLENE GLYCOL CONTENT AND THEIR USE FOR THE PRODUCTION OF POLYURETHANES

Rudolf Heusch, Leverkusen; Werner Rasshofer, Cologne; Wolfgang Reichmann, Hilden, and Adolf Richartz, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,626

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219759

Int. Cl.³ C08G *18/65, 18/66*

U.S. Cl. 252—188.31 **10 Claims**

1. A homogeneous, storage-stable, emulsifier-free polyol mixture having a high mixed OH-number and a high ethylene glycol content comprising 100 parts of a relatively high molecular weight polyalkylene oxide polyol having an OH-number of from 20 to 210, which contains at least 5%, and less than 80%, by weight of terminal ethylene oxide blocks and from 0.1 to 30 parts of a low molecular weight diol mixture having an OH-number of 1200 to 1650 in the form of a reaction product of 1 mole of ethylene glycol with 0.1 to 0.5 moles of propylene oxide.

4,518,522

BLOCKED POLYISOCYANATES WITH IMPROVED STORAGE STABILITY

Peter H. Markusch, McMurray; Robert G. Kelso, Wexford, both of Pa., and Peter D. Schmitt, Glen Dale, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 19, 1983, Ser. No. 533,081

Int. Cl.³ C08G *18/80*

U.S. Cl. 252—188.31 **15 Claims**

1. A process for improving the storage stability of a composition which contains

(a) a blocked polyisocyanate component prepared by blocking the isocyanate groups of an organic polyisocyanate with a blocking agent comprising a di-C_1–C_{12}-alkyl and/or -alkoxyalkyl malonate and

(b) is free from compounds containing at least two isocyanate-reactive hydrogens,

which comprises incorporating a stabilizing amount of a compound having monofunctional reactivity towards isocyanate groups into said composition.

4,518,523

METHOD FOR ADDING MAKE-UP FLUID BED OXIDATION CATALYSTS FOR FLUID BED OXIDATION CATALYSTS CONTAINING THE MIXED OXIDES OF VANADIUM AND PHOSPHORUS

Patricia R. Blum, Macedonia; Ernest C. Milberger, Solon, and Mark L. Nicholas, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 4, 1983, Ser. No. 472,400

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—209 **10 Claims**

1. A process adding make-up fluid bed catalyst to an equilibrated fluidizable catalyst containing the mixed oxides of vanadium and phosphorus useful in oxidizing a 4-carbon atom hydrocarbon to maleic anhydride, in a fluid bed vessel including:

(a) introducing a calcined and unequilibrated fluidizable make-up catalyst comprising the mixed oxides of vanadium and phosphorus into the fluid bed vessel containing the equilibrated fluidizable catalyst;

(b) subjecting the fluidizable make-up and equilibrated catalysts to fluidization conditions to obtain a fluidized catalyst mixture;

(c) contacting the fluidized catalyst mixture with oxygen at a temperature at least 20° C. greater than the temperature required to produce about 85 percent conversion of the 4-carbon atom hydrocarbon.

4,518,524

SILVER COATING COMPOSITION FOR USE IN ELECTRONIC APPLICATIONS AND THE LIKE

Steven R. Stoetzer, Port Huron, Mich., assignor to Acheson Industries, Inc., Port Huron, Mich.

Filed Jun. 27, 1983, Ser. No. 508,286

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—514 **16 Claims**

1. A new silver-containing composition which is liquid when applied to a substrate, and forms an electrically conductive coating on the substrate, said composition being comprised of:

(a) a silver pigment material, said pigment being finely particulated and having an average particle size of about 50 microns or less,

(b) a ferro alloy pigment material which is selected from at least one of the group consisting of ferrophosphorous, ferromanganese, ferromolybdenum, ferrosilicon, ferrochrome, ferrovanadium, ferrozirconium, ferrotitanium, ferrotungsten, ferroboron and ferrocarbide,

said ferro alloy pigment material is present in amount of about 5% to about 90% by weight of the total solids,

said ferro alloy pigment havng an average particle size of less than about 70 microns,

(c) binder resin which is selected from at least one of the group consisting of thermoplastic acrylic, vinyl, urethane, alkyd, polyester, hydrocarbon, fluoroelastomer and cellulosic resins, and thermosetting acrylic, polyester, epoxy, phenolic, urethane and alkyd resins,

(d) the pigment to binder weight ratio in said composition being between about 10 to 1 and about 4 to 1, and

(e) said composition containing a weight percent total solids from about 50% to about 85% and an organic solvent carrier for the composition being used as required.

4,518,525

METHOD FOR DIVIDING BLOOD HEMOGLOBIN INTO HEME AND GLOBIN

Karin Autio; Martti Kiesvaara, and Yrjö Mäkki, all of Espoo, Finland, assignors to Valtion Teknillinen Tutkimuskeskus, Espoo, Finland

PCT No. PCT/FI83/00022, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03198, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 11, 1983, Ser. No. 552,032

Claims priority, application Finland, Mar. 12, 1982, 820862; Feb. 22, 1983, 830589

Int. Cl.³ C07C *103/52;* **C07G** *7/00;* **A61K** *35/18, 37/02*

U.S. Cl. 260—112 B **5 Claims**

1. A method for separating blood hemoglobin into heme and globin from blood cells comprising separating blood cells from blood plasma, suspending said blood cells in an acidified aqueous medium to disassociate the hemoglobin into heme and globin, adding to said suspension carboxymethylcellulose in an amount sufficient to precipate the heme so disassociated from said hemoglobin, and recovering the resulting precipated heme product.

4,518,526

PURIFICATION AND ACTIVITY ASSURANCE OF PRECIPITATED HETEROLOGOUS PROTEINS

Kenneth C. Olson, Burlingame, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 452,356, Dec. 22, 1982,. This application Jun. 1, 1984, Ser. No. 615,682

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 R **11 Claims**

1. A process for isolating and purifying a precipitated heterologous protein from host cell culture, which process comprises:

(a) treating the host cell culture with a buffered solution of ionic strength suitable to solubilize most of the host protein, but in which refractile heterologous protein is substantially insoluble and disrupting the cells, to form a supernatant and an insoluble fraction;
(b) treating the insoluble fraction from step (a) with a strongly denaturing solution to solubilize the refractile heterologous protein, and
(c) recovering renatured heterologous protein from the solution of Step (b).

4,518,527

POLYPEPTIDES RELATED TO THE PRE-ACETYLCHOLINE RECEPTOR-α OF THE ELECTRIC ORGAN OF *TORPEDO CALIFORNICA*

Shosaku Numa, Kyoto, and Noboru Yanaihara, Shizuoka, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,747
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **15 Claims**

1. a polypeptide consisting essentially of an amino acid sequence which is at least one member selected from the group consisting of:
(a) Ser-Glu-His-Glu-Thr-Arg,
(b) Gly-Ile-Lys-Ile-Arg,
(c) Arg-Leu-Pro-Ser-Asp-Asp,
(d) Asn-Asn-Ala-Asp-Gly-Asp,
(e) Glu-Ser-Asp-Arg-Pro-Asp,
(f) Lys-Asp-Tyr-Arg-Gly,
(g) Thr-Asp-Ser-Gly-Glu-Lys,
(h) Lys-Arg-Ala-Ser-Lys-Glu-Lys-Gln-Glu-Asn-Lys,
(i) Lys-Asn-Pro-Asp-Val-Lys,
(j) Lys-Ser-Asp-Glu-Glu-Ser,
(k) Asp-Tyr-Gly-Gly-Ile-Lys,
(l) Asp-Thr-Pro-Tyr-Leu-Asp,
(m) Arg-Ser-Pro-Ser-Thr-His; and
(n) at least one member selected from a pharmaceutically-acceptable acid-addition salt of amino acid sequences (a) to (m).

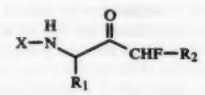
4,518,528

α AMINO FLUORO KETONES

David W. Rasnick, 2508 Magnolia Trail, Sunol, Calif. 94586

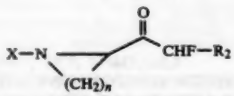
Continuation-in-part of Ser. No. 496,227, May 19, 1983, abandoned. This application Feb. 6, 1984, Ser. No. 577,068
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **12 Claims**

1. A composition of matter, comprising an αamino fluoro ketone compound of the structural formulae:



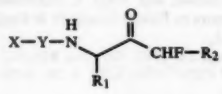
1(a)

or



1(b)

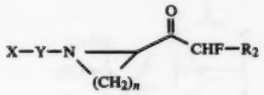
or



1(c)

or

-continued



1(d)

wherein R_1 and R_2 are independently selected from the group of hydrogen; alkyl of 1–6 carbons; substituted alkyl of 1–6 carbons; aryl; alkylaryl where the alkyl group is of 1–4 carbons; n is an integer from 1–4 inclusive; X is a peptide end-blocking group; and Y is an amino acid or peptide chain of 1–6 amino acids.

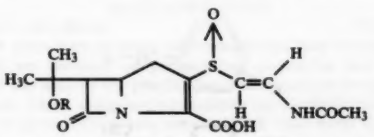
4,518,529

ANTIBIOTICS C-19393S_2

Akira Imada, Nishinomiya; Setsuo Harada, Kawanishi, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 17, 1980, Ser. No. 113,132
Claims priority, application Japan, Feb. 2, 1979, 54-11560; Jun. 26, 1979, 54-81141
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 260—245.2 T **1 Claim**

1. An antibiotic substance represented by the formula



wherein R represents —SO_3H or a pharmaceutically acceptable salt thereof.

4,518,530

6-β-SUBSTITUTED PENICILLANIC ACIDS AS β-LACTAMASE INHIBITORS

Michael S. Kellogg, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 483,921, Apr. 11, 1983, , which is a continuation of Ser. No. 96,832, Nov. 23, 1979, Pat. No. 4,397,783, which is a continuation-in-part of Ser. No. 17,809, Mar. 5, 1979, abandoned. This application Feb. 27, 1984, Ser. No. 584,127
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.³ C07D *499/00;* A61K *31/425*
U.S. Cl. 260—245.2 R **4 Claims**

1. 6-β-Bromopenicillanic acid substantially free of the 6-α-bromo epimer, or a pharmaceutically-acceptable base salt thereof.

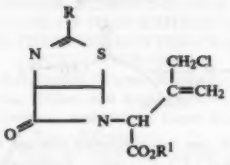
4,518,531

ALLYLIC CHLORINATION PROCESS AND COMPOUNDS PREPARED THEREBY

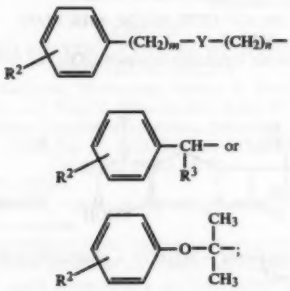
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 130,888, Mar. 17, 1980, , which is a continuation-in-part of Ser. No. 34,825, Apr. 30, 1970, abandoned. This application Nov. 14, 1983, Ser. No. 550,854
Int. Cl.³ C07D *205/08, 513/14;* C07B *9/00*
U.S. Cl. 260—245.4 **10 Claims**

1. A compound of the formula



wherein
R is hydrogen,
methoxy,
C_1–C_2 alkoxycarbonyl,
C_1–C_8 alkyl,
C_1–C_8 alkyl monosubstituted with protected hydroxy, C_1–C_3 alkoxy or cyano,
C_2–C_8 alkenyl,
C_2–C_8 alkenyl monosubstituted with protected hydroxy, C_1–C_3 alkoxy or cyano,
C_3–C_8 cycloalkyl,
C_3–C_8 cycloalkyl substituted with protected hydroxy, C_1–C_3 alkoxy or cyano,



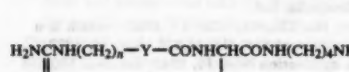
R^2 is hydrogen, protected hydroxy, chloro, bromo, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro or cyano;
Y is oxygen or a carbon-carbon bond;
R^3 is protected hydroxy, C_1–C_4 alkyl or protected amino;
m is 0–2;
n is 0–2;
R^1 is a carboxylic acid protecting group; provided that the 1- and 5-position C-H bonds are in the α-position.

4,518,532
N-[4-(3-AMINOPROPYL)-AMINOBUTYL]-2-(ω-GUANIDINO-FATTY-ACID-AMIDO)-2-SUBSTITUTED-ETHANAMIDE AND SALT THEREOF

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Hironobu Iinuma; Daishiro Ikeda, both of Tokyo; Teruya Nakamura, Kusatsu, and Akio Fujii, Kamakura, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,372
Claims priority, application Japan, Oct. 8, 1981, 56-159503
Int. Cl.³ C07C *129/12*; A61K *31/155*
U.S. Cl. 260—404.5 10 Claims

1. An N-[4-(3-aminopropyl)aminobutyl]-2-(ω-guanidinofatty-acid-amido)-2-substituted-ethanamide represented by the general formula or a pharmaceutically acceptable salt thereof



(I)

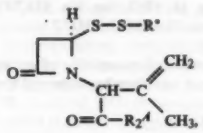
wherein Y represents —CH_2—CH_2—, or —CH=CH—, R represents a hydrogen atom, or a methyl group, and n is an integer of from 4 to 6.

4,518,533
AZETIDINONE-4-DISULFIDES AS INTERMEDIATES FOR THIA-AZA COMPOUNDS WITH A BETA-LACTAM RING

Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 353,288, Mar. 1, 1982, , which is a division of Ser. No. 902,639, May 4, 1978, Pat. No. 4,331,676. This application Sep. 24, 1982, Ser. No. 423,350
Claims priority, application Luxembourg, May 9, 1977, 77306
Int. Cl.³ C07D *205/08, 403/12, 487/04*
U.S. Cl. 260—245.4 2 Claims

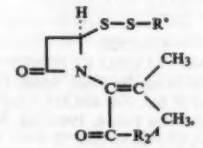
1. Compounds of the formula



(IX)

in which R° is a five-membered thiadiazacyclic, thiatriazacyclic, oxadiazacyclic, oxatriazacyclic, diazacyclic, oxazacyclic or thiazacyclic radical of aromatic character or a benzdiazacyclic, benzoxazacyclic or benzthiazacyclic radical in which the heterocyclic part is five-membered and has an aromatic character, which radical is bonded to the thio group —S— by one of its ring carbon atoms that is bonded to a ring nitrogen atom by a double bond and which radical is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen or phenyl, and R_2^4 together with the carbonyl group —C(=O) represents a protected carboxyl group.

2. Compounds of the formula



(X)

in which R° is a five-membered thiadiazacyclic, thiatriazacyclic, oxadiazacyclic, oxatriazacyclic, diazacyclic, oxazacyclic or thiazacyclic radical of aromatic character or a benzdiazacyclic, benzoxazacyclic or benzthiazacyclic radical in which the heterocyclic part is five-membered and has an aromatic character, which radical is bonded to the thio group —S— by one of its ring carbon atoms that is bonded to a ring nitrogen atom by a double bond and which radical is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen or phenyl, and R_2^4 together with the carbonyl grouping —C(=O) represents a protected carboxyl group.

4,518,534
LAYERED VANADIUM COMPOUNDS CONTAINING PHOSPHORUS OR ARSENIC AND PENDANT ORGANIC GROUPS

Jack W. Johnson, Clinton, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 22, 1983, Ser. No. 525,142
Int. Cl.³ C07F *9/00, 9/38, 9/70, 9/09*
U.S. Cl. 260—429 R 18 Claims

1. A solid composition of matter comprising layered oxides

containing vanadium together with phosphorus or arsenic and a monovalent organic group, said layered compounds having one of the formulae:

$VORAO_3.nS$ or $VOROAO_3.nS$

where A is phosphorus or arsenic, S is a solvent molecule, R is an unsubstituted or alkyl-, alkoxy- or aryl-substituted alkyl or aryl group or a mixture thereof, and n is zero or a positive number, the layered compounds being characterized in that the vanadium has an average oxidation state in the range of 3.6 to 4.4 and is present in an amount such that the molar ratio of A:V ranges from, 0.8 to 1.2 throughout the oxide and the R groups are covalently bound to an A atom in the vanadium oxide layer directly through either carbon or oxygen.

4,518,535

PREPARATION OF ELECTRICALLY CONDUCTIVE SYSTEMS FROM SUBSTITUTED PHENALENES, AND THE PRODUCTS OBTAINED

Herbert Naarmann, Wattenheim; Volker Muench, Ludwigshafen; Gernot Köhler, Ludwigshafen, and Petr Simak, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,717

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217097

Int. Cl.³ C07F *1/08, 1/10, 15/00, 15/02*

U.S. Cl. 260—438.1 **11 Claims**

1. A process for the preparation of an air-stable, electrically conductive system having a conductivity greater than $10^{-3}\Omega^{-1}cm^{-1}$, comprising reacting a metal cation of an element of sub-group VII, VIII or I of the periodic table of elements with a 1,9-substituted phenalene of the formula (I)

(I)

where x is O, NH, S, Se or Te and Y is —OH, —SH or —NH, to give a metal chelate, and reacting this metal chelate with a 1.5-fold to 10-fold molar excess of an organic electron acceptor, in an inert chlorohydrocarbon or chlorofluorohydrocarbon as the solvent, at about +40° to +100° C.

4,518,536

COMPOSITIONS, WHICH PROMOTE PLANT GROWTH AND PROTECT PLANTS, BASED ON OXIME ETHERS AND OXIME ESTERS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 129,499, Mar. 11, 1980, Pat. No. 4,466,822, which is a division of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,059

Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 8, 1978, 1348/78

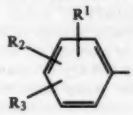
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.³ C07C *121/66*

U.S. Cl. 260—465 D **6 Claims**

1. A compound of the formula

wherein Ar represents naphthyl or



in which

R_1 represents hydrogen, halogen, lower alkyl, lower alkoxy of phenoxy in the para-position which is optionally substituted a maximum of twice by halogen, cyano, nitro or trifluoromethyl, and

each of R_2 and R_3 represents hydrogen, halogen, nitro, lower alkyl, trifluoromethyl or lower alkoxy,

and Q is lower alkanecarboxylic acid ester in which the ester moiety has from 1 to 8 carbon atoms.

4,518,537

PROCESS FOR ISOLATING PARAFFINSULFONATE FROM THE REACTION MIXTURE OBTAINED ON SULFOXIDATING PARAFFINS

Rudolf Pistorius, Hünstetten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,634

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1983, 3304017

Int. Cl.³ C07C *139/00*

U.S. Cl. 260—504 R **3 Claims**

1. A process for isolating paraffinsulfonate from the extracts which are obtained on sulfoxidating n-paraffins and from which the bulk of the paraffin has been separated by adding alcohol, which comprises neutralizing the alcoholic paraffinsulfonic acid solutions thus obtained with alkali metal hydroxides in such a way as not to drop below pH 7, and continuously concentrating in a preheated evaporator at at least 130° C., the paraffinsulfonate solution obtained on separating off the precipitated alkali metal sulfate.

4,518,538

PROCESS FOR MAKING METHYLDICHLOROPHOSPHANE

Klaus Gehrmann; Alexander Oborodnik, both of Erftstadt; Johannes Rosenthal, Cologne, and Stefan Schäfer, Brühl, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,106

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149937

Int. Cl.³ C07F *9/52*

U.S. Cl. 260—543 P **1 Claim**

1. In a process for making methyldichlorophosphane by reacting methane with phosphorus trichloride in the presence of 2 to 7 mol percent carbon tetrachloride, based on the phosphorus trichloride used, at temperatures of 500° to 650° C. and over a period of time of 0.1 to 0.9 second, the improvement which comprises effecting the reaction under a pressure of 3 to 6 bars, the proportion of carbon tetrachloride added being reduced at increasing pressure.

4,518,539

PROCESS FOR MAKING ACETIC ANHYDRIDE

Wilhelm Vogt, Bellerstrasse 74, Hürth, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,355

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230307

Int. Cl.³ C07C *51/56*

U.S. Cl. 260—549 **3 Claims**

1. A process for making acetic anhydride which comprises reacting methyl acetate or dimethylether with a gas contaning

carbon monoxide and 5 to 30 volume % hydrogen under practically anhydrous conditions at temperatures of 390° to 540° K., under pressures of 1 to 300 bars in the presence of a catalyst system consisting essentially of noble metals belonging to group VIII of the Periodic System of the elements or their compounds, vanadium or niobium or their compounds, iodine or its compounds and a tertiary or quaternary organic compound selected from the group consisting of compounds of nitrogen, phosphorus, arsenic or antimony.

4,518,540

MULTI-FUEL CARBURETOR

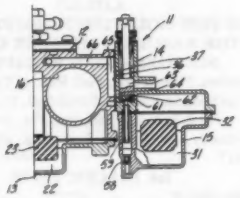
Hidekazu Takayasu, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushika Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Jan. 25, 1983, Ser. No. 460,765

Claims priority, application Japan, Jan. 26, 1982, 57-9583

Int. Cl.³ F02M *13/06*

U.S. Cl. 261—18 B **16 Claims**



1. In a multi-fuel carburetor having a main body portion defining an induction passage, a main fuel bowl, main fuel discharge circuit means for delivering fuel from said main fuel bowl to said induction passage, a supplementary passage communicating with said induction passage and extending through said main body portion, and an auxiliary body carrying auxiliary fuel bowl means for supplying an auxiliary fuel to said induction passage, the improvement comprising said supplementary passage of said main body terminating in a face of said main body engaged by said auxiliary body for cooperation of said supplementary passage with a corresponding passage in said auxiliary body and for delivering fuel to said induction passage from said auxiliary fuel bowl means, and cold starting valve means interposed in said auxiliary body for controlling the flow of fuel from said auxiliary fuel bowl means to said supplementary passage.

4,518,541

LIQUID AERATING APPARATUS

Derek W. Harris, Lincolnshire, England, assignor to Sodastream Limited, Peterborough, England

PCT No. PCT/GB83/00202, § 371 Date Apr. 10, 1984, § 102(e) Date Apr. 10, 1984, PCT Pub. No. WO84/00671, PCT Pub. Date Mar. 1, 1984

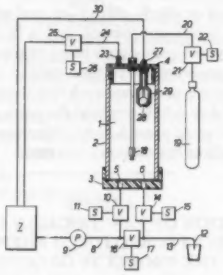
PCT Filed Aug. 11, 1983, Ser. No. 599,610

Claims priority, application United Kingdom, Aug. 20, 1982, 8224061

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—27 **15 Claims**

1. Apparatus for carbonating liquids, comprising a carbonating chamber (**1**), first valve means (**10,14**) for controlling admission of liquid to and discharge of carbonated liquid from the chamber, a gas jet nozzle (**18**) mounted in the chamber for injecting carbon dioxide gas into liquid contained in the chamber, means for connecting the jet nozzle to a source of pressurised gas including second valve means (**21**) for controlling the supply of gas, pressure releasing means communicating with an upper part of the chamber and including third valve means (**25**), characterised in that said first, second and third valve means are electrically actuable and controlled by electronic control means (**43**) so programmed that in response to a start signal supplied to the control means, the first valve means is actuated for the admission of liquid to the chamber to substantially fill the chamber, after closure of said first valve means the said second valve means is actuated one or more times for periods of set duration for gas to be supplied to the jet nozzle and injected into the liquid, after termination of the gas supply



and a short delay the said third valve means is opened to release the pressure in the chamber, and following a further short delay after opening the third valve means the first valve means may be actuated for carbonated liquid to be discharged from the chamber.

4,518,542

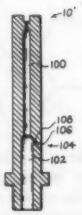
CARBURETOR ATTACHMENT

Jerry L. Rogers, R.R. 6, Box 2515, Springfield, Mo. 65803

Continuation-in-part of Ser. No. 108,419, Dec. 31, 1979, abandoned. This application Feb. 26, 1981, Ser. No. 238,639

Int. Cl.³ F02M *7/02*

U.S. Cl. 261—34 R **1 Claim**



1. In an engine carburetor having a main body in communication with said engine, a float chamber, a passage communicating said chamber and said body, an improved jet in said chamber and inserted in said passage for conveying fuel from said float chamber to said passage comprising:

a generally elongated member having upper and lower ends with a bore running therethrough and presenting an opening at said lower end thereof in communication with said passage, said member having a configuration designed to position said upper end above a normal level of fuel found in said float chamber;

said bore consisting of upper and lower communicating shafts with said lowe shaft increasing in cross-sectional area at the point of juncture and having throughout a cross-sectional area greater than said upper shaft;

means for fastening said member to said carburetor with said opening communicating with said passage;

means adjacent said upper end of said member for communicating said upper shaft with the ambient air surrounding said upper end of said member; and

means adjacent said lower end of said member for conducting said surrounding fuel from said float chamber into said lower shaft upon actuation of said carburetor, said con-

ducting means comprising a port inserted adjacent said lower end of said member and presenting an upwardly extending channel in communication with said surrounding fuel and said lower shaft, said port further including a recess for receiving a portion of said surrounding fuel therein to prime said channel with said fuel; whereupon actuation of said carburetor said ambient air is drawn through said communicating means and into said upper air shaft, said relatively smaller cross-sectional area of said upper air shaft delimiting the volume of said ambient air drawn therethrough and into said lower shaft in a manner to provide continuity to said conduction of fuel being drawn through said channel and into said lower shaft whereby to maintain a continuous admixture of said fuel and said air within said lower shaft prior to discharge from said opening.

4,518,543

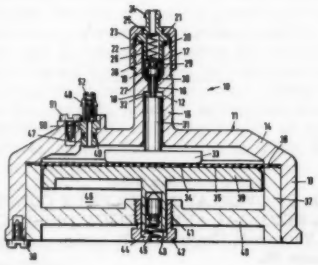
DEVICE FOR THE DOSED DIFFUSION OF GASES IN LIQUIDS

Dieter Dorsch, Heilbronn, Fed. Rep. of Germany, assignor to Günter Grittmann, Eppingen-Muhlbach, Fed. Rep. of Germany

Continuation of Ser. No. 289,111, Jul. 31, 1981, abandoned. This application Oct. 12, 1983, Ser. No. 540,904

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—64 B **10 Claims**



1. A device for dosed diffusion of gases in liquids, particularly for application in the field of aquaria, consisting of a hollow body diffusor, a gas inlet at the upper portion of said diffusor, said inlet connected to an automatically regulating pressure-regulating valve, said valve blocked on the supply-pressure side by a valve smaller than said pressure-regulating valve operable by means of an actuating member subjected to the regulating pressure and to an adjustable prestress, said smaller valve consisting of a valve head loaded by means of a compression spring and axially movable against a sealing ring, said valve head lifted out of its leak-tight seat by means of a tappet, one end of said tappet directed to said valve head, a mushroom-shaped thrust member mounted on the opposite end of and movable with said tappet, said thrust member resting on an elastic disc-shaped diaphragm shutting off in a leak-tight manner the regulating-pressure region of said pressure-regulating valve.

4,518,544

SERPENTINE FILM FILL PACKING FOR EVAPORATIVE HEAT AND MASS EXCHANGE

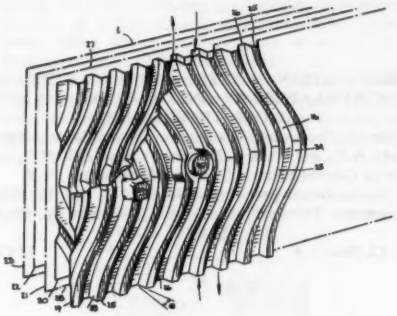
Thomas P. Carter, Laurel; Edward N. Schinner, Highland; Richard H. Harrison, Jr., Columbia, and Robert E. Cates, Arnold, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Jan. 20, 1983, Ser. No. 459,735

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—112 **15 Claims**

1. Surface-type heat and mass exchanger fill packing assembly having a top, bottom and side edges for use in an evaporative heat and mass transfer apparatus for producing interaction between a liquid and a gas, said assemably being composed of continuously curved or serpentine-grooved, spaced vertically aligned sheets forming passageways having valleys and ridges formed by said grooves extending in a generally continuously curved, sinusoidal or serpentine path fr©m edge to edge of said sheets, the groove width at a ridge or valley constantly varying in width from edge to edge of the sheet along the



groove, and the entrance angle for liquid at the one edge and gas at the opposite edge of the fill, being the angle of the groove relative to the perpendicular, is maintained nearest to said perpendicular, and where the groove side wall angle relative to the perpendicular to the plane of said fill is constant at any position on said fill, said passageways providing space and surface for liquid and gas interaction, the sheets having the ridges of adjacent sheet grooves forming variable-angle isosceles angular relationship with one another.

4,518,545

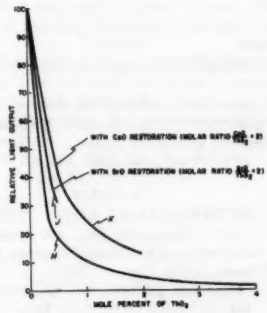
METHOD FOR SINTERING HIGH DENSITY YTTRIA-GADOLINIA CERAMIC SCINTILLATORS

Dominic A. Cusano; Charles D. Greskovich, both of Schenectady, N.Y., and Frank A. DiBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,829

Int. Cl.³ C04B *35/50*

U.S. Cl. 264—1.2 **23 Claims**



1. A method for preparing a transparent-to-translucent yttria-gadolinia polycrystalline ceramic scintillator body comprising the steps of:

preparing a multicomponent powder consisting essentially of between 5 and 50 mole percent Gd_2O_3, between about 0.02 and 12 mole percent of at least one rare earth activator oxide selected from the group consisting of Eu_2O_3, Nd_2O_3, Yb_2O_3, Dy_2O_3, Tb_2O_3, and Pr_2O_3, at least one

transparency promoter selected from the group consisting of ThO_2, ZrO_2, and Ta_2O_5, and at least one light output restorer selected from the group consisting of CaO and SrO, the remainder of said multicomponent power being Y_2O_3;

cold pressing said multicomponent powder to form a powder compact; and

sintering said powder compact in either a reducing atmosphere or vacuum to yield a transparent-to-translucent polycrystalline ceramic body.

4,518,546

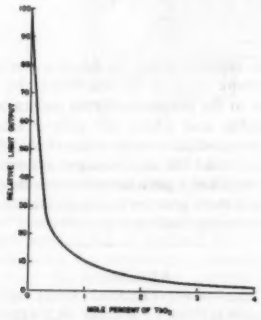
PREPARATION OF YTTRIA-GADOLINIA CERAMIC SCINTILLATORS BY SINTERING AND GAS HOT ISOSTATIC PRESSING

Charles D. Greskovich; Dominic A. Cusano, both of Schenectady, N.Y., and Frank A. DiBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 389,817, Jun. 18, 1982, abandoned. This application May 8, 1984, Ser. No. 608,323

Int. Cl.[3] **C04B** *35/50*

U.S. Cl. 264—1.2 **22 Claims**



1. A method for preparing a transparent-to-translucent polycrystalline ceramic X-ray or gamma-ray scintillator body comprising the steps of:

preparing a multicomponent powder consisting essentially of Y_2O_3, Gd_2O_3, and at least one rare earth activator oxide selected from the group consisting of Eu_2O_3, Nd_2O_3, Yb_2O_3, Dy_2O_3, Tb_2O_3, and Pr_2O_3;

pressing said multicomponent powder to form a powder compact;

sintering said powder compact to the closed porosity stage; and

gas hot isostatically pressing the sintered compact with an inert gas to yield a transparent-to-translucent polycrystalline ceramic scintillator body.

4,518,547

MICROENCAPSULATION PROCESS

George W. Cuff, Indianapolis, Ind., and James W. McGinity, Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 15, 1983, Ser. No. 532,458

Int. Cl.[3] **A61K** *9/50, 9/58;* **B01J** *13/02*

U.S. Cl. 264—4.7 **10 Claims**

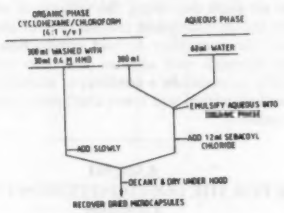
1. A process for the encapsulation of a hydrophilic core material in a membrane formed by interfacial polycondensation, the process comprising:

in a first step, dispersing in a first continuous hydrophobic phase a hydrophilic phase comprising in solution the hydrophilic material to be encapsulated and a hydrophilic solvent or water; and then

in a second stage, adding separately to the dispersion either sequentially or simultaneously, each of two complementary polycondensation monomer reactants:

the first polycondensation monomer reactant comprising a hydrophobic solvent-soluble reagent;

the second polycondensation monomer reactant comprising a hydrophilic solvent-soluble reagent dispersed in a second continuous hydrophobic phase;



allowing the polycondensation monomers to react, the reaction effective to cause interfacial polymerization of a membrane encapsulating the hydrophilic phase containing the hydrophilic core material; and

separating the encapsulated material from the continuous hydrophobic phase.

4,518,548

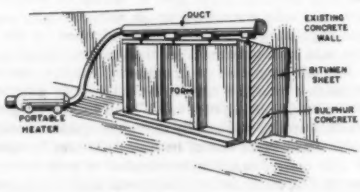
METHOD OF OVERLAYING SULPHUR CONCRETE ON HORIZONTAL AND VERTICAL SURFACES

Roger L. Yarbrough, Champaign, Ill., assignor to Sulcon, Inc., Champaign, Ill.

Filed May 2, 1983, Ser. No. 490,345

Int. Cl.[3] **B28B** *1/54;* **C04B** *35/60*

U.S. Cl. 264—32 **9 Claims**



1. A method of placing sulphur concrete against or over an existing outer solid surface of a wall, floor, or column base, comprising:

(a) first applying to said outer surface a layer of a bituminous material to form a bitumen-containing exposed surface thereon, the bitumen in said exposed surface becoming liquified at temperatures at which molten sulphur concrete is initially placed;

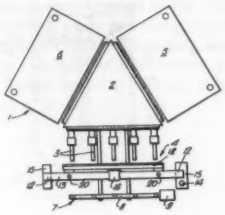
(b) pouring a course of molten sulphur concrete mix against or over said bitumen-containing surface, the bitumen therein melting to form a liquid slip plane in contact with said course; and

(c) setting said layer of bituminous material and said course of sulphur concrete by temperature reduction, whereby said sulphur concrete can shrink during cooling without being restrained by said existing solid surface.

4,518,549
APPARATUS FOR AND METHOD OF COOLING THE CORE RODS OF AN INJECTION BLOW MOULDING MACHINE

Reginald J. Hart, Chapel-En-Le-Frith, England, assignor to Roymere Limited, England

Filed Nov. 2, 1983, Ser. No. 547,793
Claims priority, application United Kingdom, Feb. 4, 1983, 8303056; Sep. 13, 1983, 8324500
Int. Cl.[3] B29C *17/07*
U.S. Cl. 264—39 17 Claims



1. Apparatus for cooling the core rods of an injection blow moulding machine having a stripping station at which blow moulded articles are removed from the core rods by stripper means movable between a retracted position in which blow moulded articles on the core rods can be engaged by the stripper means and an advanced position in which the blow moulded articles are removed from the core rods, the apparatus comprising nozzle means for directing cooling fluid onto the tips of the core rods, means for moving said nozzle means relative to the core rods and independently of the stripper means between an out-of-use position in which the nozzle means is out of the path of movement of the stripper means and an in-use position in which the nozzle means is interposed between the core rods and the stripper means and is adapted to direct cooling fluid onto the core rods, and means for supplying cooling fluid to said nozzle means when the nozzle means is in in-use position.

14. A method of cooling the core rods of an injection blow moulding machine having a stripping station at which blow moulded articles are removed from the core rods by stripper means movable between a retracted position in which blow moulded articles on the core rods can be engaged by the stripping means and an advanced position in which the blow moulded articles are removed from the core rods, the method comprising the steps of engaging the blow moulded articles with said stripper means, removing the blow moulded articles from the core rods by moving the stripper means to said advanced position, interposing nozzle means between the core rods and the stripper means, directing a cooling fluid onto the tips of the core rods using said nozzle means, and moving the nozzle means to an out-of-use position on completion of cooling of the core rods.

4,518,550
METHOD OF MANUFACTURING RIGID FRAME BUILDING ELEMENTS FILLED WITH HARD FOAM PLASTIC

Jorma K. Miettinen, and Eero J. Virtanen, both of Kankaanpää, Finland, assignors to Makrotalo Oy, Kankaanpää, Finland

Filed May 16, 1983, Ser. No. 494,895
Int. Cl.[3] B29D *27/04;* B30B *1/32*
U.S. Cl. 264—46.5 4 Claims

1. A method of manufacturing rigid frame building elements filled with hard foam plastic wherein the building elements have wooden frames covered by plates on opposite sides forming enclosed hollow interior spaces, the method comprising the steps of:

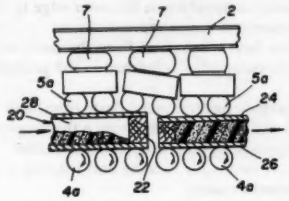
charging a quantity of delayed foaming plastic material into the enclosed hollow interior spaces of the building elements,

delivering the charged building elements into a conveying and compression gap between upper and lower roller conveyors before the foaming plastic material expands to produce pressure within the interior spaces,

driving the rollers of the lower conveyor to advance the building elements along a conveying path through the conveying and compression gap,

engaging the plates covering the building elements with a plurality of rollers of each of the respective upper and lower roller conveyors throughout advancing of the building elements along the conveying path,

said engaging with the upper and lower pluralities of rollers being at lines transverse to the conveying path and extending substantially across the width of the surfaces of the plates wherein the lines are closely spaced along the conveying path so that said engaging resists bending of the plates between the lines due to pressure of the foaming material,



maintaining said engaging step in the conveying and compression gap for a duration greater than the duration required for the expansion of the foaming plastic material and the cessation of the pressure exerted thereby,

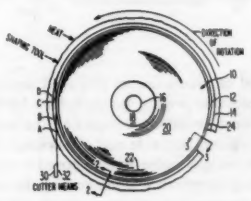
compressing the rollers of the upper conveyor against its respective engaged plate during said maintaining and engaging steps by means of pressure members with a pressure exceeding the pressure generated by the foaming plastic material within the building elements, and

individually moving the rollers of the upper conveyor in a vertical direction during the maintaining and compressing steps so that the rollers of the upper conveyor follow dimensional changes of the building elements between the plates and maintain substantially even pressure on the plates.

4,518,551
METHOD AND APPARATUS FOR TRIMMING AND FINISHING THE OUTER EDGE OF A MOLDED RECORD

Peter T. Lin, East Brunswick, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,242
Int. Cl.[3] B29D *17/00*
U.S. Cl. 264—107 18 Claims



1. The method for trimming flash from and finishing the outer edge of a record molded from a thermoplastic composition, said method comprising the steps of:

(a) rotating the record having flash formed on its outer edge about its center;

(b) selectively heating the flash and the outer edge of the record immediately adjacent the flash to a temperature above the glass transition temperature of the thermoplastic composition;

(c) tangentially advancing a cutter means through the heated flash and through a tangent point on the outer edge while simultaneously rotating the record at least one complete revolution to provide a trimmed outer edge;

(d) bringing an edge shaping means for imparting a predetermined configuration into contact with the trimmed outer edge;

(e) rotating the record with the trimmed outer edge in contact with said shaping means until the outer edge is shaped to the predetermined configuration; and

(f) discontinuing heating the outer edge allowing the thermoplastic composition at the outer edge to cool below its glass transition temperature,

whereby the flash is removed from the outer edge of the record and the outer edge is finished in the predetermined configuration.

11. Apparatus for trimming flash from and finishing the outer edge of a record molded from a thermoplastic composition, said apparatus comprising in combination:

(a) support means for holding and rotating a record about the record's center;

(b) cutter means for trimming flash from the record;

(c) guide means adjacent the support means for holding the cutter means and for guiding the cutter means in a path which is tangential to the outer edge of a record positioned on the support means;

(d) heating means positioned adjacent the support means including a heat source for selectively heating the flash and outer edge of a record positioned on the support means to a temperature above the glass transition temperature of the thermoplastic composition; and

(e) edge shaping means positioned adjacent the support means for engaging and shaping the trimmed outer edge of a record into a predetermined configuration.

4,518,552

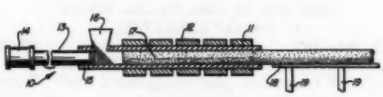
METHOD OF PRODUCING ACCURATELY SIZED MATERIAL OF ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Tadao Matsuo, Kakogawa; Fumio Matsuoka, Kobe; Nobuo Yokota, Hyogo, and Masaaki Yamamoto, Amagasaki, all of Japan, assignors to Mitsuboshi Belting Ltd., Nagata, Japan

Filed Nov. 9, 1983, Ser. No. 549,828

Int. Cl.³ B27J 5/00

U.S. Cl. 264—126 **14 Claims**



1. A method of producing an extruded sintered product of ultra high molecular weight polyethylene having low transverse dimensional deviation, comprising the steps of:

mixing an organic peroxide and a lubricant with ultra high molecular weight polyethylene powder; and

ram extruding the mixture while heating the mixture directly to a high temperature to concurrently effect cross-linking and sintering of the powder to form a cross-linked sintered product having a transverse dimension deviation of less than approximately 2 mm.

4,518,553

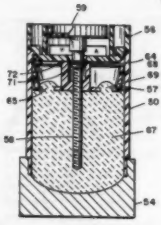
PROCESS FOR PRODUCING A WAX-LIKE STICK PRODUCT

Mary E. Yarossi, Hoboken, and Carey S. Trevisan, W. Orange, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 22, 1983, Ser. No. 534,534

Int. Cl.³ B29C 5/00, 27/30, 25/00

U.S. Cl. 264—234 **9 Claims**



1. A process for the manufacture of a solid, wax-like stick product, which comprises the steps of attaching a pouring cap closure to the upper portion of a suitable container for said stick, said container being open at the bottom; inverting said container body and filling from the bottom thereof with a premeasured quantity of wax-like composition in a molten state; cooling said stick to partially solidify it and form a void in an upper surface of said composition; heating said stick to melt the upper surface and fill in said void; inserting into the bottom portion of said container body before said upper surface solidifies, a twist-up device, cooling said composition for sufficient time to form within said container a solid, wax-like stick and re-inverting the container.

4,518,554

METHOD AND APPARATUS FOR MOLDING A TUBULAR CONTAINER WITH A CAP

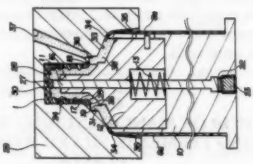
Yoshiharu Hatakeyama, Tokyo; Tatsuo Ishikawa, and Kenzo Teshima, both of Chiba, all of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,877

Claims priority, application Japan, Sep. 14, 1982, 57-158836

Int. Cl.³ B29C 5/00, 1/00; B29F 1/022

U.S. Cl. 264—262 **4 Claims**



1. A method for molding a resin-made container with a cap, said method comprising:

providing a female die having a cap-receiving recess, and a male die having a fixed guide rod and a sliding die member movable along said guide rod and urged outwardly therealong;

inserting a cap having internal threads into said recess of said

female die, with an open end of said cap facing outwardly of said recess;

inserting said male die into said female die and thereby centrally inserting said guide rod into said cap, clamping an outer end portion of a premolded container body provided about said male die between said dies, and defining a cavity portion between said sliding die member and the inner surface of said cap and another cavity portion between said dies; and

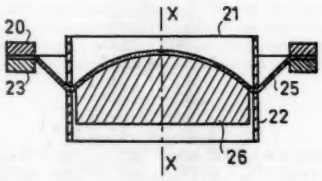
injecting a synthetic resin, which is compatible with said container body but which will not fuse with said cap, into said another cavity portion, and by the injection pressure forcing said sliding die member along said guide rod away from said female die, thereby enlarging said another cavity portion, and molding in said cavity portions a container neck within said cap and an integral container shoulder fused with said outer end.

4,518,555

MANUFACTURING AN ACTIVE SUSPENSION ELECTROMECHANICAL TRANSDUCER

Pierre Ravinet, and Francois Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 239,642, Mar. 2, 1981, Pat. No. 4,401,911. This application Jun. 14, 1983, Ser. No. 504,159
Claims priority, application France, Mar. 4, 1980, 80 04838
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—292 **2 Claims**



2. A process for manufacturing an electromechanical transducer having at least one active element in the form of at least one film of a polymer material shaped so as to have a spherical skullcap at its center and at the periphery of the spherical skullcap the film is shaped as a truncated cone with rectilinear generatrices along the marginal radii of the spherical skullcap, said process comprising:

clamping said polymer film between an inner set of jaws for delimitating a central area;

further clamping said polymer film between an outer set of jaws for delimitating a peripheral area surrounding said central area;

stretching said peripheral area by moving said inner set of jaws in relation to said outer set in order to form said truncated cone shape; and

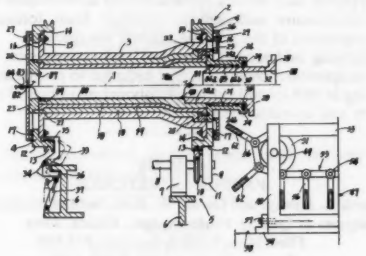
shaping said central area by driving a punch towards said central area in order to form said spherical skullcap.

4,518,556

METHOD FOR MOLDING BENT PIPES MADE UP OF COMPOSITE MATERIAL

Masahiko Yamamoto, Nishinomiya; Yoshinori Nishino, Yamato Takada; Akio Komura, Osaka, and Tomio Ebisu, Taishibashi, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan

Filed Apr. 14, 1981, Ser. No. 254,051
Claims priority, application Japan, Jul. 1, 1980, 55-093285[U]; Jul. 2, 1980, 55-093768[U]; Jul. 14, 1980, 55-096498; Aug. 19, 1980, 55-114357
Int. Cl.³ B29C *5/04*
U.S. Cl. 264—295 **17 Claims**



1. A method of manufacturing bent pipes made up of a composite material comprising the steps of:

rotating around a straight horizontal axis a substantially cylindrical resilient molding tool adapted to be deformed between a straight-axis profile and a bent-axis profile;

feeding pipe forming materials into said molding tool;

centrifugally molding in said molding tool a pipe made up of said pipe forming materials and at least having an inner wall, an outer wall and an uncured axially intermediate portion;

inserting in the centrifugally molded pipe a flexible bag provided on its outer periphery with absorbent layer means, and inflating said bag so as to press said absorbent layer means against the inner wall of said molded pipe and to eliminate by said absorbent layer means the air or gas bubbles produced in the inner wall of said molded pipe;

bending said molding tool so that said molded pipe is correspondingly bent therein; and

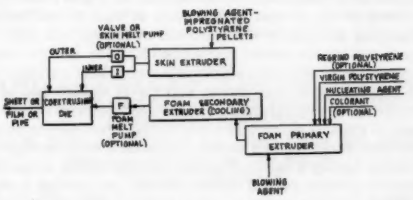
removing the resulting bent pipe from said molding tool after the bent pipe has been wholly cured.

4,518,557

PROCESS FOR SKIN FOAM

Sheldon M. Wecker, Libertyville, Ill., assignor to James River-Norwalk, Inc., So. Norwalk, Conn.

Filed May 18, 1981, Ser. No. 264,574
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—45.9 **11 Claims**



1. In a method of making a foamed plastic product having a relatively low density cellular core structure and a substan-

tially non-cellular outer layer or skin wherein a first or foam stream of foamable normally solid molten polymer containing blowing agent is fed to a co-extrusion die under pressure and expanded on exiting from said die to form said cellular core and a second or skin stream of said normally solid molten polymer is supplied to said co-extrusion die to form said skin, the improvement which comprises:

incorporating a volatile organic blowing agent and a nucleating agent in said first or foam stream of polymer,

incorporating a volatile organic blowing agent in said second or skin stream of polymer in an amount effective to match the viscosity of said second stream to that of said first stream and maintain stable flow of said second stream relative to said first stream,

supplying said second stream to said co-extrusion die at a temperature sufficient to produce foam formation on expansion of the polymer leaving the die, and

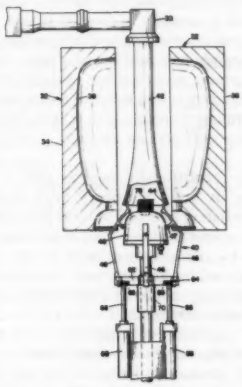
supplying said second stream to said co-extrusion die at a temperature lower than that required to producing foaming in said second stream of polymer on release of pressure in said co-extrusion die.

4,518,558

PARISON STRETCHER

Kenneth L. Anway, and Gerald W. Born, both of Mentor, Ohio, assignors to Quality Products, Inc., Eldora, Iowa

Filed Mar. 7, 1983, Ser. No. 472,580
Int. Cl.³ B29C *17/07*; B29D *3/00*
U.S. Cl. 264—515 **6 Claims**



1. A method for producing hollow plastic articles having a relatively wide body, a narrow neck and a relatively wide funnel shaped mouth comprising the steps of downwardly extruding plastic at at least one predetermined extrusion rate to progressively form a parison having a downwardly facing open end from a first location adjacent an extrusion head toward a second location axially spaced therefrom, said parison having a diameter smaller than the diameter of said wide mouth, providing a male mold member having an outer surface corresponding to said wide mouth at said second location, engaging portions of the open end of the parison while said open end travels toward said second location, and moving the engaged portions downwardly at a rate at least corresponding to said extrusion rate, during said travel toward said second location, radially expanding the engaged portions of said open end to guide it along said outer surface over said male mold member, enclosing said parison in a hollow mold having a first portion having a molding surface corresponding to the blow-molded portion of said hollow article, and having a second portion having a molding surface corresponding to the narrow neck and wide mouth of said hollow article and cooperating with said male mold member, admitting air to the interior of the first portion of said hollow mold to form said wide body by blow molding while forming the neck and wide mouth by compression molding by the cooperation between the second portion of the mold and the male member.

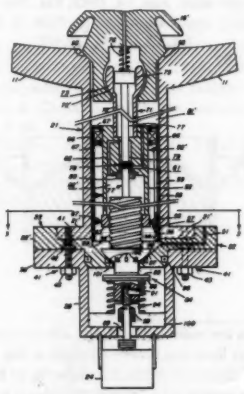
6. Apparatus for producing hollow plastic articles having a relative wide body, a narrow neck and a relatively wide funnel shaped mouth comprising: extrusion head means for extruding a tubular thermoplastic parison having a downwardly facing open end and at least one predetermined extrusion rate, said parison having a diameter smaller than the diameter of said wide mouth, segmented mold means comprising a plurality of cooperating mold members having first and second inner surface portions respectively defining the body, neck and mouth of the article to be molded, means for radially translating said segmented mold means toward said tubular parison to a position forming a continuous mold surface, means defining a male mold member beneath and in axial alignment with said extrusion head means, said male mold member having an outer surface cooperating with the second surface portions of said mold means to form the neck and mouth of said article by compression molding, stretching means having finger means for engaging portions of the open end of the parison while said parison is being extruded at a predetermined rate, means for radially expanding said finger means outwardly and for moving said finger means downwardly at a rate at least corresponding to said predetermined rate for stretching said parison over said male mold, by-cam following said male member outer surface and passage means to the interior of said mold for conducting air for blow molding said body.

4,518,559

CONTROL OF NUCLEAR REACTORS

Larry E. Fischer, Los Gatos; Bettadapur N. Sridhar, Cupertino, and Jackie E. Bean, Santa Clara, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 8, 1982, Ser. No. 396,151
Int. Cl.³ G21C *7/12*
U.S. Cl. 376—230 **4 Claims**



1. A vertically oriented control rod drive device positioned beneath a pressure vessel for selectively inserting a control rod into a nuclear reactor core in said pressure vessel, comprising: a tubular drive housing secured to the bottom of said pressure vessel and extending downward therefrom; a lower housing secured to and closing the lower end of said drive housing; a drive piston having an upper head portion and a lower, elongated, annular skirt portion reciprocably disposed in said drive housing, said drive housing including sealing means for providing a fluid seal between said drive piston and said drive housing; an upwardly extending coupling member secured to the top end of said drive piston and including coupling means for releasably coupling said drive piston to said control rod; a

coupling release rod coaxially positioned in said connecting member and penetrating into said drive piston and being reciprocable between an upper position and a lower position; latching means secured to said coupling release rod for latching said coupling means to said control rod when said release rod is in its lower position and for releasing said coupling means from said control rod when said release rod is in its upper position; means for admitting a drive fluid at a pressure higher than the pressure in said pressure vessel to the under side of said drive piston for rapid fluid drive insertion of said control rod into said core; a screw drive arrangement for alternatively driving said control rod into and out of said core including a threaded spindle extending through said lower housing and into said skirt portion of said drive piston, said spindle being formed with a splined lower end, the upper end of said spindle normally abutting the lower end of said coupling release rod; a drive nut mounted on said threaded spindle including means for preventing rotation of said drive nut but allowing axial travel thereof, the bottom end of said skirt portion of said drive piston normally reposing upon said drive nut whereby the weight of said drive piston and the control rod coupled thereto is transferred to said spindle and whereby rotation of said spindle in a direction to move said drive nut upward drives said drive piston upward, and rotation of said spindle in the other direction moves said drive nut downward, said drive piston following said drive nut downward by force of gravity; a reversible drive motor for said spindle with a motor drive shaft extending coaxially toward said spindle; a splined connection connected at its lower end to said motor drive shaft for rotation thereby and having a splined upper portion engaging the splined lower end of said spindle for rotation thereof by said motor, said splined connection being effective for dividing said control rod drive into plural sections for ease of installation and removal; a spring member surrounding and engaging a part of said splined connection lower end and adapted to urge said splined connection upward whereby said spring is normally compressed by the weight of said splined connection, said drive piston and the control rod coupled together, the drive connection between said motor drive shaft and said splined connection allowing limited axial movement of said splined connection from between the compressed and decompressed positions of said spring member; a seat for said control rod in the bottom of said pressure vessel, said seat defining the most downward position of said control rod in said pressure vessel whereby further rotation of said spindle in the direction to move said drive nut downward relieves said spring of the weight of said control rod with resultant decompression of said spring and upward movement of said spindle and said coupling release rod for releasing said coupling means from said control rod.

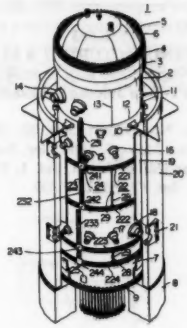
4,518,560

RAIL APPARATUS AROUND NUCLEAR REACTOR PRESSURE VESSEL AND METHOD OF INSTALLING THE SAME

Kazuo Takaku; Akisuke Naruse; Hirotsugu Fujimoto, and Hiroshi Kimura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Oct. 20, 1982, Ser. No. 435,349
Claims priority, application Japan, Oct. 21, 1981, 56-168375
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—245 **12 Claims**

1. A rail apparatus disposed around a nuclear pressure vessel for running an inspection device, comprising a plurality of circumferential rails spaced from each other, a plurality of turn tables, a first plurality of vertical rails connected to said circumferential rails through said turn tables to form a partial assembly of the rail apparatus, a second plurality of vertical rails connected to and extending upward from the uppermost circumferential rail through said turn tables, and supporting means through which said second plurality of vertical rails are attachable to a gamma shield for suspending said rail apparatus with said circumferential rails and vertical rails spaced outwardly and apart from the pressure vessel and for enabling said rail apparatus to be lifted together with said pressure vessel,



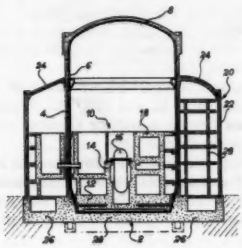
and a swing prevention device positionable between said gamma shield and said rail apparatus.

4,518,561

REACTOR BUILDING

Jean C. Hista, Versailles, France, assignor to Framatome et Cie, Courbevoie, France

Filed Feb. 5, 1982, Ser. No. 346,114
Claims priority, application France, Feb. 10, 1981, 81 02580
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—293 **6 Claims**



1. A building structure for a nuclear reactor constituted by a confinement enclosure comprising a cylindrical skirt sealed in its upper part by a dome, a ring building surrounding the confinement enclosure and which comprises a cylindrical skirt and a roof connected to the cylindrical skirt of the confinement enclosure, the latter and the ring building being erected on a common general foundation raft or floor, and internal structures positioned within the confinement enclosure, said internal structures being disengaged from said confinement enclosure, wherein the roof of the ring building is toroidal or frustum-shaped and is embedded in the cylindrical skirt of the confinement enclosure.

4,518,562

IN SITU REGENERATION OF THE EFFICIENCY OF ACTIVATED CARBON FILTERS FOR TRAPPING RADIOACTIVE IODINE

Victor R. Deitz, 3310 Winnett Rd., Chevy Chase, Md. 20815

Filed Jun. 22, 1983, Ser. No. 506,790
Int. Cl.³ G21C *19/42*
U.S. Cl. 376—313 **6 Claims**

1. A method of in situ regenerating a carbon filter of a nuclear reactor used for trapping radioactive iodine by introducing a controlled quantity of a chemical reducing agent selected

from a group consisting of hydrazine, hydrazine derivatives, hydroxylamine and hydroxylamine derivatives into the air flow from the reactor space to the carbon filter.

4,518,563

METHOD FOR MANUFACTURING A SLIDE MEMBER

Tetsuya Suganuma, Nagoya, and Koji Kazuoka, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 393,651, Jun. 30, 1982, abandoned. This application May 17, 1984, Ser. No. 610,945

Claims priority, application Japan, Jul. 1, 1981, 56-102445

Int. Cl.³ B22F *1/00*

U.S. Cl. 419—29 **8 Claims**

1. A method of manufacturing a slide member, said method comprising the steps of:

(a) mixing an alloy powder comprising by weight from 2.5% to 7.5% Cr, from 0.1% to 3.0% Mn, from 0.2% to 0.8% P, from 1.0% to 5.0% Cu, from 0.5% to 2.0% Si, from 0.0% to 3% Mo, from 1.5% to 3.5% C, and the balance Fe having less than 2% impurities; then

(b) compressing said alloy powder at a molding product pressure of 5 to 7 tons/cm^2 to form a compressed powder mass; then

(c) sintering said compressed powder mass at a temperature of between 1020° C. and 1180° C. to produce a sintered alloy mass having a surface thereon and a plurality of internal pores therein; then

(d) subjecting said sintered alloy mass to a pressure of between 0.1 atmospheres and 0.8 atmospheres for from 1.5 to 2.5 hours, thereby facilitating the entry of a soaking gas into said pluraity of internal pores in the next step; and then

(e) exposing said sintered alloy mass to a soaking gas containing 20% to 40% by volume of steam and 60% to 80% by volume of a gas selected from the group consisting of non-oxidizing gas, an endothermic gas, or a mixture thereof for between 0.5 hours and 5 hours at a temperature of between 450° C. and 550° C. and at a pressure of between 0.1 and 0.8 atmospheres, thereby forming a film of tri-iron tetroxide on the surface of said sintered alloy mass and on the walls of said plurality of internal pores in said sintered alloy mass.

4,518,564

GALLIUM AND SILVER FREE, PALLADIUM BASED DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 538,495, Oct. 3, 1983, abandoned. This application May 30, 1984, Ser. No. 616,261

Int. Cl.³ C22C *5/04*

U.S. Cl. 420—464 **12 Claims**

1. A dental alloy for porcelain-fused-to-metal restorations consisting essentially of, on a weight basis, about 60–90% palladium, an effective amount of ruthenium up to about 2% for the purpose of grain-refining the alloy, an effective amount of copper up to about 30% for the purpose of lowering the melting point and raising the thermal expansion, up to about 15% indium, up to about 16% tin, up to about 12% zinc, up to about 5% gold, and from about 0.05 to about 0.25% boron or calcium boride, the total of the named constituents being 100%, wherein the sum of the copper, indium, tin and zinc concentrations is greater than about 18%, the sum of the indium, tin and zinc concentrations is greater than about 10%, and the sum of the indium and zinc concentrations is greater than about 5%, such that said alloy exhibits a melting point between about 1100° C. and 1400° C. and a coefficient of thermal expansion of about 0.66 to 0.72 at 500° C.

4,518,565

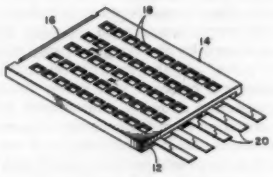
REAGENT TEST DEVICE HOLDER

David L. Boger, South Bend; Jerry T. Pugh, and Jack Zuidema, both of Elkhart, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 6, 1983, Ser. No. 501,609

Int. Cl.³ G01N *21/01, 31/22*; B01L *9/00*

U.S. Cl. 422—58 **6 Claims**



1. Apparatus for simultaneously making multiple analyses of liquid fluid, which apparatus comprises in combination:

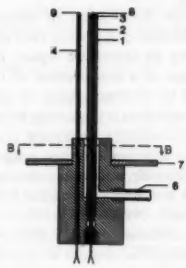
multiple, separate, dip-and-read reagent test devices, each consisting essentially of one carrier matrix pad, having reagent incorporated therein, attached to the upper surface of one end of an elongated, flexible substrate, wherein each said carrier matrix pad is raised to a height substantially above the surface of the substrate to which said matrix pad is attached; and

reagent test device holding means for accurately positioning and retaining said carrier matrix pads of the reagent test devices immobile during analyses, said reagent test holding means consisting essentially of a base member for retaining said reagent test devices in parallel alignment, a separate top member containing openings substantially identical in size, number and configuration to the carrier matrix pads, hinge means for interconnecting the base member and the top member wherein the openings of said top member are in registry with each carrier matrix pad of said reagent test devices such that the reagent pads project into said openings so as to immobilize and isolate each carrier matrix pad during the analysis of a liquid fluid and substantially eliminate runover from occurring between adjacent carrier matrix pads on the reagent test devices, wherein said reagent test device holding means is constructed of a rigid, cleanable material of thickness such that the openings in said top member form wells into which liquid fluid to be analyzed is placed.

4,518,566
DEVICE FOR DETERMINING THE CONCENTRATION OF AN ABSORBABLE COMPONENT IN A GASEOUS MIXTURE

Ansgar C. H. Sorensen, Anemonevej 4, Allerod, Denmark (DK-3450)

Division of Ser. No. 287,728, filed as PCT DK 80/00072, Nov. 19, 1980, published as WO 81/01615, June 11, 1980, § 102(e) date Jul. 24, 1981, Pat. No. 4,407,963.
This application May 19, 1983, Ser. No. 495,991
Claims priority, application Denmark, Nov. 30, 1979, 5100/79
Int. Cl.³ G01N *31/06*
U.S. Cl. 422—88 3 Claims



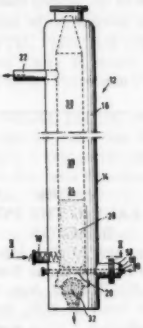
1. A measuring device for determining the concentration of an absorbable component in a gaseous mixture comprising a vertical hollow tube having a heat conducting wall and an open mouth at its upper end, means for passing a stream of liquid absorbent upwards through said tube at a rate such that the liquid absorbent is not sprayed out of the mouth of the tube but remains in contact with the tube so as to form above said mouth a free surface area from which the liquid absorbent overflows along the outside of the tube, means adjacent the upper end of said tube for passing a flow of a gaseous mixture past the upper end of said tube and said free surface area of absorbent and in surface contact therewith, a first temperature sensor being disposed in said tube and being fitted adjacent the mouth of the tube in a location such as to be completely covered by the liquid absorbent flowing out of the mouth of said tube, a supporting member extending up through the tube and supporting, at its top, said first temperature sensor, and a second temperature sensor being positioned adjacent to said first temperature sensor and upstream thereof so that said gaseous mixture contacts said second temperature sensor prior to contacting the upper end of said tube so as to measure the temperature of said gaseous mixture immediately before it arrives into contact with the absorbent at the upper end of the tube.

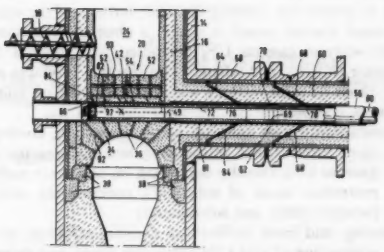
4,518,567
REACTOR FOR THE GASIFICATION OF SOLID CARBONACEOUS MATERIALS

Günther Velling, Borheim/Hersel; Lothar Schrader, Erftstadt-Liblar, and Hermann Schumacher, Bedburg-West, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 416,993
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137136
Int. Cl.³ B01J *8/24, 8/44;* F27B *15/10*
U.S. Cl. 422—143 20 Claims

1. Reactor comprising a reactor chamber having walls for gasification of solid carbonaceous materials in a fluidized bed under elevated pressure and high temperatures, with a feed device for a hot gasification agent, at least one bridge-shaped structure of refractory material installed in the reactor chamber, a conduit located inside the bridge-shaped structure running essentially in the longitudinal direction of the bridge-shaped structure for conveying the gasification agent, the conduit being provided with openings through which the gasification agent can pass from the conduit through the bridge-shaped structure into the reactor chamber, wherein said bridge-shaped structure contains a lower portion of the bridge-shaped structure (**20**, **120**) consisting of refractory bricks (**36**) assembled to form a self-supporting arch (**34**), opposite ends of the arch (**34**) being braced on corresponding opposite inner walls of the reactor chamber (**24**), the conduit comprising a metal pipeline (**42**) within the bridge-shaped structure, the



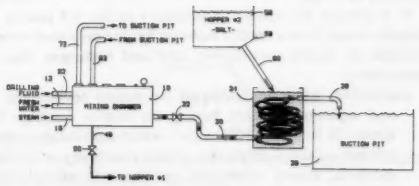


metal pipeline being lined on the inside with refractory material (**74**) which also has openings (**86**) which correspond to the openings (**88**) in the metal pipeline at least in the area of the reactor chamber (**24**), the entire outer surface of metal pipeline (**42**), except the areas adjacent the openings in the conduit, being shielded by the refractory material of the bridge-shaped structure.

4,518,568
SYSTEM TO PRODUCE A BRINE-BASED DRILLING FLUID

Bruce L. Shannon, Salt Lake City, Utah, assignor to The Standard Oil Company, Chicago, Ill.

Filed Nov. 12, 1982, Ser. No. 440,896
Int. Cl.³ E21B *21/06*
U.S. Cl. 422—261 3 Claims



1. A system for preparing water-based drilling fluid comprising:

(a) an enclosed mixing chamber including first piping means including inlets for conveying supplies of water, heated fluid, and drilling fluid components into the interior of the mixing chamber;
(b) barrel means for retaining a supply of salt;
(c) second piping means for conveying fluid from the interior of the mixing chamber to the interior of the barrel means and for conveying fluid from the interior of the barrel means to a suction pit; and
(d) third piping means for conveying fluid from the suction pit to the interior of the mixing chamber and for conveying fluid from the interior of the mixing chamber directly to the suction pit.

4,518,569

PROCESS FOR CLEANING THE INNER WALLS OF A REACTOR

Michel Perrot, Orsay, and Michel Jaccaud, Lyons, both of France, assignors to Pechine Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 824,720, Aug. 15, 1977, abandoned. This application Mar. 18, 1980, Ser. No. 131,095
Claims priority, application France, Sep. 2, 1976, 76 26954
Int. Cl.³ C01G *43/06*
U.S. Cl. 423—19 **4 Claims**

1. A process for cleaning the inner surfaces of the walls of a chemical reactor vessel in which a chemical reaction takes place wherein gaseous UF_6 is reacted with gaseous NO to produce $NOUF_6$, and wherein said reaction produces a parasitic phase of solid $NOUF_6$ which is deposited on said inner surfaces, comprising:

concurrently with carrying out said reaction, cooling said inner surfaces, and introducing into said reactor excess gaseous UF_6, thereby depositing on said inner surfaces a protective agent of solid UF_6 concurrently with said parasitic phase; and subsequently

heating said inner surfaces an amount sufficient to cause sublimation of said UF_6 protective agent, and thereby to cause shattering of said parasitic phase and removal of said parasitic phase from said inner surfaces.

4,518,570

PROCESS FOR SEPARATING ANTIMONY FROM COLUMBIUM SOLUTIONS

Harvey Stewart, Newtown Square, and C. Edward Mosheim, Hereford Township, Berks County, both of Pa., assignors to Cabot Corporation, Boston, Mass.

Filed Nov. 7, 1983, Ser. No. 549,285
Int. Cl.³ C01G *33/00, 30/00*
U.S. Cl. 423—63 **9 Claims**

1. A process for removing antimony in the +4 and/or +5 valence states from a methyl isobutyl ketone saturated aqueous solution of oxyfluorocolumbic acid and hydrogen fluoride, comprising:

contacting, using liquid/liquid extraction techniques, the said aqueous solution having an acidity ranging from about 3N to about 10N with a water-immiscible, organic solvent selected from the group consisting of ketones, alcohols, ethers, aldehydes, and organic phosphates to extract the antimony from the solution into the organic solvent.

4,518,571

PROCESS FOR DESILICATION OF ALUMINATE LIQUORS IN THE PRODUCTION OF ALUMINA

Nikolai A. Kaluzhsky; Viktor M. Sizyakov; Vladimir V. Andreev; Alexei I. Alexeev, all of Leningrad; Khoren A. Badalians; Isaak A. Zatulovsky, both of Pikalevo Leningradskoi; Valentin I. Korneev, Leningrad, and Ivan M. Kostin, Pikalevo Leningradskoi, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievo Magnievoi I Elektrodnoi Promyshlennosti and Leningradsky Tekhnologichesky Institut Imeni Lensoveta, both of Leningrad, U.S.S.R.

Filed Feb. 27, 1984, Ser. No. 583,944
Int. Cl.³ C01F *7/04*
U.S. Cl. 423—119 **3 Claims**

1. A process for desilication of aluminate liquors in the production of Alumina comprising two stages of desilication:

(1) Heat-treating an aluminate liquor, obtained after digestion of a sinter, at a temperature of 150°–170° C. under a pressure of 6 to 12 atmospheres to remove the main portion of SiO_2 and Fe_2O_3 impurities in the form of an aluminosilicate mud which is separated;

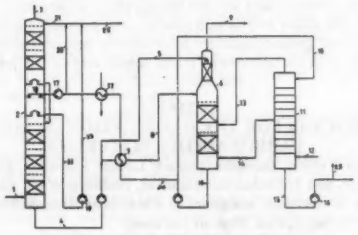
(2) Treating the aluminate liquor with a desilication agent which is a lime pulp containing oxides CaO, Al_2O_3, SiO_2, Fe_2O_3, NaO_2 in a mass ratio of CaO: $(SiO_2+Fe_2O_3)$=1,0-00–5,000:1 and Na_2O:Al_2O_3=0.25–0.60:1, said Na_2O being in the carbonate form, wherein CaO is active in an amount ensuring the content of active CaO in the aluminate liquor within the range of 5 to 10 g/l, whereby the remaining portion of SiO_2 and Fe_2O_3 impurities being removed, pass into the solid phase with the formation of calcium hydrogarnet of the formula: $3CaO(Al, Fe)_2O_3 \cdot mSiO_2.(6-2m).H_2O$, wherein m=0.01–0.5, which is separated in the form of a mud.

4,518,572

METHOD OF WASHING HYDROGEN SULFIDE FROM COKE OVEN GAS BY THE AMMONIUM SULFIDE METHOD

Horst Ritter, Essen, Fed. Rep. of Germany, assignor to Dr. C. Comp G.m.b.H., Bachum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 302,806, Sep. 16, 1981, abandoned. This application Jan. 12, 1984, Ser. No. 570,087
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035895
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—234 **4 Claims**



1. In the ammonium sulfide method of washing hydrogen sulfide from coke oven gas including a hydrogen sulfide scrubber for which

(1) coke oven gas containing hydrogen sulfide is introduced into the bottom of the said scrubber;

(2) coke oven gas having a reduced hydrogen sulfide content is recovered from the top of the said scrubber;

(3) aqueous ammonia wash water is introduced into the top of the said scrubber; and

(4) aqueous ammonia wash liquor containing dissolved hydrogen sulfide is withdrawn as a scrubber bottom stream

from the bottom of the said scrubber, the improvement comprising:

removing hydrogen sulfide from the said scrubber bottom stream to produce a deacidified stream comprising weak aqueous ammonia, cooling said deacidified stream of weak aqueous ammonia to a temperature of 20 to 30 degrees C.;

introducing the cooled deacidified stream of weak aqueous ammonia liquor at a temperature of 20 to 30 degrees C. and an ammonia content of 15 to 25 grams per liter at a high velocity through spray nozzles in the mid-region of the said scrubber to release ammonia vapor in the mid-region of said scrubber at a higher partial pressure than the partial pressure of ammonia in the region of the nozzles, and withdrawing from the said scrubber below the said nozzles a side stream of weak aqueous ammonia liquor corresponding in volume to the said cooled deacidified stream and introducing said side stream into the top of said scrubber.

4,518,573
DIFFERENTIAL FLOTATION REAGENT AND METHOD OF PREPARATION

John A. Peterson, Niagara Falls; Mohan S. Saran, Grand Island, and Joseph S. Wisnouskas, Amherst, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 471,608, Mar. 3, 1983,. This application Jul. 16, 1984, Ser. No. 631,262

Int. Cl.³ C01B *25/14;* C22B *1/00*

U.S. Cl. 423—303 **10 Claims**

1. A method for preparing a dry differential flotation reagent for molybdenum-bearing ore comprising the steps of:

(a) reacting P_4S_{10} with an alkali mixture of NaOH and NaSH in a molar ratio of P_4S_{10} to alkali of from about 1:15 to about 1:17, said mixture containing at least about 50 mole percent of NaOH, and

(b) drying the reaction mixture.

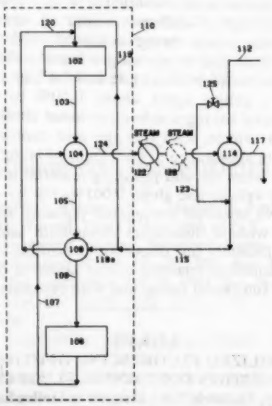
4,518,574
CATALYTIC GAS SYNTHESIS PROCESS

Robert M. Osman, Parsippany, and Larry J. Shulik, Morristown, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 7, 1983, Ser. No. 472,998

Int. Cl.³ C01C *1/08*

U.S. Cl. 423—360 **20 Claims**



1. In a process for the production of a gaseous product by exothermic catalytic reaction of a gas feedstream, the improvement which comprises reacting said gas feedstream in a reactor comprising at least two sequentially arranged catalyst stages; gas supply means for introducing at least a portion of said gas feedstream to a first of said catalyst stages; gas removal means for removing said gaseous product from the last of said catalyst stages; and interbed reheat exchange means for heating at least a portion of said gaseous product by indirect heat exchange with a heating fluid, prior to withdrawl of said gaseous product from said reactor, said heating fluid comprising at least a portion of the gaseous effluent withdrawn from at least one other of said catalyst stages.

4,518,575
CATALYTIC FIBROUS CARBON

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 343,642, Jan. 28, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 562,790

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.³ D01F *9/12*

U.S. Cl. 423—447.3 **17 Claims**

1. A process of producing microfibrous carbon comprising pyrolyzing a carbon containing substance in the presence of a catalyst comprising:

(a) an iron Group VIII metal containing substance, selected from iron, cobalt and nickel,

(b) a Group IVb metal containing substance, and

(c) a Group Va element containing substance.

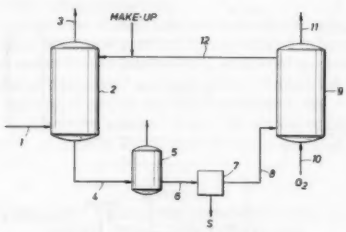
4,518,576
H_2S REMOVAL FROM GAS STREAMS

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1983, Ser. No. 563,476

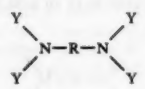
Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—573 R **12 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising

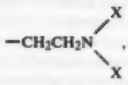
(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the reaction solution comprising an effective amount of an oxidizing polyvalent metal chelate of an acid having the formula



wherein

from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxyethyl, 2-hydroxy propyl, and



wherein

X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen atoms are in the 1,2 position; and mixtures thereof; and an amount of phosphate and thiosulfate ions effective to improve sulfur quality, said phosphate and thiosulfate ions being present in a molar ratio of from 0.5 to 3:1, and producing a sweet gas stream and an aqueous solution containing crystalline sulfur and reduced reactant;

(b) removing crystalline sulfur from the aqueous solution;

(c) regenerating the aqueous solution having reduced sulfur content in a regenerating zone and producing regenerated reactant in said solution; and

(d) returning regenerated solution from step (c) to the contacting zone.

4,518,577

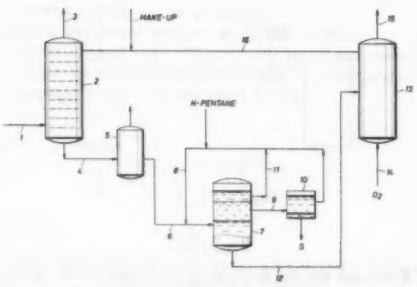
SULFUR SEPARATION PROCESS

Miro E. Klecka, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1982, Ser. No. 451,705

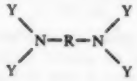
Int. Cl.[3] C01B *17/05*; B01D *53/34*

U.S. Cl. 423—573 R **24 Claims**



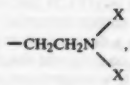
1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution containing an effective amount of a reactant comprising an oxidizing polyvalent metal chelate of an acid having the formula



from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxy ethyl, 2-hydroxy propyl, and



wherein X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen atoms are in the 1,2 position; and mixtures thereof,

and producing a sweet gas stream and an aqueous admixture containing sulfur and reduced reactant;

(b) removing aqueous admixture from the contacting zone;

(c) contacting aqueous admixture in an extraction zone with a liquid composition selected from compounds having the formula $C_nH_{2(n+1)}$, wherein n is a number from 4 through 8, and mixtures thereof, in an amount sufficient to remove at least the bulk of the sulfur from said admixture and form a separate phase containing sulfur and said composition, and forming a three phase mass comprising an upper mass containing solid sulfur and said liquid composition, and a lower phase in contact with said upper mass, said lower phase comprising aqueous admixture containing reduced reactant;

(d) separating at least a portion of the upper mass, and recovering sulfur from the portion separated;

(e) separating aqueous admixture containing reduced reactant from the lower phase, and regenerating said separated aqueous admixture in a regeneration zone to produce an aqueous admixture containing a regenerated reactant;

(f) returning aqueous admixture from the regeneration zone to the contacting zone.

4,518,578

DENTIFRICE COMPOSITION CONTAINING VISUALLY CLEAR PIGMENT-COLORED STRIPE

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 494,744, May 16, 1983, Pat. No. 4,456,585.

This application Jun. 14, 1984, Ser. No. 597,996

Int. Cl.[3] A61K *9/16*

U.S. Cl. 424—7.1 **7 Claims**

1. A dentifrice comprising a visually clear coloured dentifrice stripe together with a dentifrice which is clear and non-coloured, clear and of different colour or opaque, said coloured dentifrice stripe being coloured without requiring water-soluble dyes and comprising a liquid vehicle having a refractive index between about 1.36 and 1.47, up to about 10% by weight of a gelling agent, about 5–50% by weight of a polishing material having a refractive index similar to that of the said liquid vehicle, such that the said dentifrice stripe is visually clear in appearance to the extent of being transparent or translucent when the said polishing material is dispersed in the said liquid vehicle and about 0.001%–1% by weight of a colour-intensive insoluble conjugated pigment dispersed homogeneously without dissolution throughout said dentifrice stripe with sufficiently fine dispersion permitting retention of clarity, said dentifrice retaining colour imparted by said pigment without substantial fading and with retention of clarity.

4,518,579

PH STABILIZED FLUORESCING OPHTHALMIC COMPOSITION CONTAINING FLUOREXON

Frank J. Holly, Lubbock, Tex., assignor to Holles Laboratories, Cohasset, Mass.

Filed Aug. 31, 1979, Ser. No. 71,738

Int. Cl.[3] G01N *31/00, 33/48*; A01N *43/90*

U.S. Cl. 424—9 **10 Claims**

1. An ophthalmic solution for use in a human eye comprising

an aqueous solution of fluorexon, the solution having a pH between about 5.4 and about 6.2, and sufficient eye compatible buffer to maintain said pH after said solution is instilled into the eye.

10. A method of fitting hydrogel contact lens in a human eye comprising instilling an aqueous solution of fluorexon the solution having a pH between about 5.4 and about 6.2, and sufficient eye compatible buffer to maintain said pH after said solution is instilled into the eye, and examining said eye and lens with a light of an appropriate wavelength.

4,518,580

EXPANDED CORNCOB GRITS HAVING INCREASED ABSORPTIVITY AND A METHOD FOR THE PREPARATION THEREOF

Nunzio R. Pasarela, Brooksville, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 111,563, Jan. 14, 1980, abandoned. This application Mar. 30, 1984, Ser. No. 594,946

Int. Cl.³ A01N *25/26*

U.S. Cl. 424—16 **2 Claims**

1. Expanded corncob grits characterized as having a bulk density range of from 280 g/l to 353 g/l and absorbed therein insecticidal containing liquids of from 25% to 43% by weight of the grits.

2. The product according to claim 1, wherein the liquid is soybean oil having dissolved therein 1.25% to 2.5%, by weight, tetrahydro-5,5-dimethyl-2-(1H)-pyrimidinone-{3-[4-trifluoromethyl)phenyl]-1-{2-[4-trifluoromethyl)phenyl]e-thenyl}-2-propenylidene}hydrazone, based on the weight of the oil.

4,518,581

IMPARTING LOW- OR ANTI-CARIOGENIC PROPERTY TO ORALLY-USABLE PRODUCTS

Toshio Miyake; Mikihiko Yoshida, and Kano Takeuchi, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Sep. 28, 1982, Ser. No. 428,117

Claims priority, application Japan, Nov. 2, 1981, 56-174455; Dec. 28, 1981, 56-210161

Int. Cl.³ A23G *3/00, 3/30*

U.S. Cl. 424—48 **25 Claims**

1. In an orally-usable product containing sucrose as a sweetener, the improvement whereby a low- or anti-cariogenic property is imparted to the product, wherein said product comprises a substance selected from the group consisting of isomaltosyl mono-, di-, tri-glucoses, reduction products thereof and mixtures thereof, said substance being present in an amount effective to impart a low- or anti-cariogenic property to the product, said amount being at least 5% on the dry solid basis.

4,518,582

ACID STABLE DIBENZYL MONOSORBITOL ACETAL GELS

Thomas J. Schamper, Ramsey, N.J.; Martin M. Perl, Brooklyn, and James D. Warren, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 373,590, Apr. 30, 1982, abandoned. This application Jun. 6, 1983, Ser. No. 501,462

Int. Cl.³ A61K *7/32, 7/34, 7/38*

U.S. Cl. 424—66 **7 Claims**

1. A solid transparent, gelled antiperspirant composition comprising:

(a) 1 to 80 percent by weight of a reactive solvent;

(b) 0 to 75 percent by weight of a non-reactive solvent;

(c) 1 to 10 percent by weight of dibenzyl monosorbitol acetal;

(d) 0 to 35 percent by weight of an emollient;

(e) 5 to 25 percent by weight of an acidic antiperspirant-active metal salt;

(f) 0 to 2.5 percent by weight of a C_{12} to C_{20} fatty acid; and

(g) 0.05 to 15 percent by weight of a gel stabilizer selected from the group consisting of magnesium sulfate, zinc acetate and hexamethylenetetramine, and mixtures thereof.

4,518,583

HEMORRHOID AND ANORECTAL DISEASE TREATMENT METHOD

Damian J. Gallina, 2856 W. 33rd St., Erie, Pa. 16506

Continuation-in-part of Ser. No. 468,334, Feb. 22, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 640,952

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.³ A61K *31/17, 31/79, 31/675*

U.S. Cl. 424—80 **13 Claims**

1. A method of treating hemorrhoids and anorectal diseases by applying to hemorrhoids and anorectal tissues a composition comprising a peroxide selected from the group of urea hydrogen peroxide and benzoyl peroxide in a pharmaceutically effective amount for treatment of hemorrhoidal and anorectal tissues, and a vehicle.

4,518,584

HUMAN RECOMBINANT INTERLEUKIN-2 MUTEINS

David F. Mark, Danville; Leo S. Lin, Fremont, and Shi-Da Y. Lu, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 486,162, Apr. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 435,154, Oct. 19, 1982,. This application Dec. 20, 1983, Ser. No. 564,224

Int. Cl.³ A61K *45/02, 37/02;* **C07C** *103/52;* **C07G** *7/00;* **C12P** *21/06;* **C12N** *15/00*

U.S. Cl. 424—85 **10 Claims**

1. Recombinant human interleukin-2 mutein. wherein the cysteine at position 125, numbered in accordance with native human interleukin-2, is deleted or replaced by a neutral amino acid and said mutein exhibits the biological activity of native, human interleukin-2.

9. A formulation comprising:

(a) a recombinant human interleukin-2 mutein, wherein the cysteine residue at position 125, numbered in accordance with native human interleukin-2, is deleted or replaced by a neutral amino acid and said mutein exhibits the biological activity of native, human interleukin-2; and

(b) a polypeptide selected from the group consisting of gamma interferon, B cell growth factor and IL-1.

4,518,585

HYDROGEN PEROXIDE DISINFECTING AND STERILIZING COMPOSITIONS

Donald F. Greene, Middletown, and Virginia L. Urban, Midland Park, both of N.J., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 902,006, May 1, 1978, abandoned. This application Nov. 20, 1979, Ser. No. 95,947

Int. Cl.³ A01N *31/00, 31/14, 59/00*

U.S. Cl. 424—130 **12 Claims**

1. An aqueous disinfecting and sterilizing composition consisting essentially of by weight of the composition:

(a) from about 0.5 to about 50 percent of hydrogen peroxide,

(b) from about 0.1 to about 30 percent of a surfactant which is compatible with hydrogen peroxide,

(c) from about 0.1 to about 3 percent of an organic or inorganic acid,

(d) from 0 to about 1 percent of an organic triazole corrosion inhibitor,

(e) from about 0.01 to about 1 percent of an aqueous-alcoholic mixture of a tertiary amine and a fatty acid alkanolamide and

(f) the balance water;

said composition havng a pH below about 5.

4,518,586

GRF ANALOGS III

Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 532,170, Sep. 29, 1983, , which is a continuation-in-part of Ser. No. 457,862, Jan. 13, 1983,. This application Oct. 25, 1983, Ser. No. 545,094

Int. Cl.³ C07C *103/52;* A61K *37/02*

U.S. Cl. 514—12 **20 Claims**

1. A synthetic peptide, or a nontoxic salt thereof, having the formula: H-R_1-R_2-R_3-Ala-Ile-Phe-Thr-R_8-Ser-R_{10}-Arg-R_{12}-R_{13}-Leu-R_{15}-Gln-R_{17}-R_{18}-Ala-Arg-Lys-Leu-R_{23}-R_{24}-R_{25}-Ile-R_{27}-R_{28}-Arg-Gln-Gln-Gly-Glu-R_{34}-Asn-Gln-Glu-R_{38}-R_{39}-R_{40}-Arg-R_{42}-R_{43}-R_{44}-Y wherein R_1 is Tyr, D-Tyr, Met, Phe, D-Phe, pCl-Phe, Leu, His or D-His having either a C^{α}Me or N^{α}Me substitution or being unsubstituted; R_2 is Ala or D-Ala; R_3 is Asp or D-Asp; R_8 is Ser, Asn, D-Ser or D-Asn; R_{10} is Tyr or D-Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{15} is Gly or D-Ala; R_{17} is Leu or D-Leu; R_{18} is Tyr or Ser; R_{23} is Leu or D-Leu; R_{24} is His or Gln; R_{25} is Glu, Asp, D-Glu or D-Asp; R_{27} is Met, D-Met, Ala, Nle, Ile, Leu, Nva or Val; R_{28} is Asn or Ser; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe, Ala or Val; R_{43} is Asn or Arg; R_{44} is a natural amino acid; and Y is the radical —COOR, —CRO, —CONHNHR, —CON(R)(R′) or —CH_2OR, with R and R′ being lower alkyl, fluoro lower alkyl or hydrogen; provided however that either R_{17} or R_{23} is D-Leu or R_{25} is either D-Glu or D-Asp and that any or all of the residues between R_{29} and R_{44}, inclusive, may be deleted.

4,518,587

DIPEPTIDES OF L-5-HYDROXYTRYPTOPHAN, PROCESSES FOR THEIR PREPARATION AND DRUGS IN WHICH THEY ARE PRESENT

Claude Laruelle, Villeneuve Loubet; Marcel Lepant, Vence, and Bernard Raynier, Cagnes, all of France, assignors to S.A. Panmedica, Carros, France

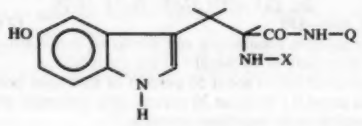
Filed May 18, 1984, Ser. No. 611,987

Claims priority, application France, May 24, 1983, 83 08493

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 514—19 **6 Claims**

1. Dipeptides of L-5-hydroxytryptophan of the general formula I below:



wherein X is hydrogen or a lower acyl radical and Q is a free or esterified aminoacid radical selected from the group consisting of alanine, valine, leucine, isoleucine, proline, phenylalanine, tryptophan, methionine, glycine, serine, threonine, cysteine, tyrosine, asparagine, glutamine, aspartic acid, glutamic acid, lysine, and histidine, and their pharmaceutically compatible addition salts with acids or base.

4,518,588

PROCESS FOR THE PREPARATION OF AN INCLUSION COMPLEX OF N-(1--PHENYLETHYL)-3,3-DIPHENYLPROPYLAMINE AND THE HYDROCHLORIDE THEREOF RESPECTIVELY WITH CYCLODEXTRIN

Jozsef Szejtli; Agnes Stadler nee Szoke; Maria Vikmon nee Kiraly; Dezso Korbonits; Sandor Virag; Istvan Turcsan, and Pal Kiss, all of Budapest, Hungary, assignors to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU82/00024, § 371 Date Dec. 22, 1982, § 102(e) Date Dec. 22, 1982, PCT Pub. No. WO82/04052, PCT Pub. Date Nov. 25, 1982

PCT Filed May 12, 1982, Ser. No. 456,029

Claims priority, application Hungary, May 12, 1981, 1286-81

Int. Cl.³ A61K *31/73;* C08B *37/16*

U.S. Cl. 514—58 **19 Claims**

19. A coronary dilatative calcium antagonist method of treatment which comprises administering to a susceptible subject an effective amount of a composition consisting essentially of N-(1-phenylethyl)-3,3-diphenylpropylamine or its hydrochloride complexed with at least one cyclodextrin selected from the group which consists of α-cyclodextrin, β-cyclodextrin and γ-cyclodextrin.

4,518,589

BBM-2478 ANTIBIOTIC COMPLEX

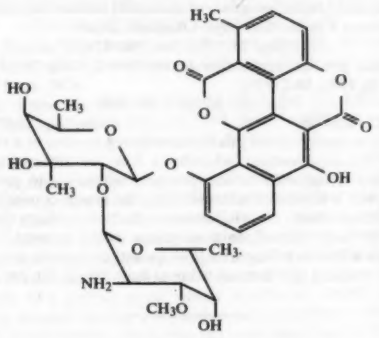
Masataka Konishi, Kawasaki; Koko Sugawara, Wakō; Takeo Miyaki, Yokohama, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,453

Int. Cl.³ A61K *31/71;* C07H *15/24*

U.S. Cl. 514—27 **8 Claims**

1. The antibiotic BBM-2478A having the formula



3. A method for therapeutically treating an animal host affected by a bacterial infection which comprises administering to said host an effective antibacterial dose of BBM-2478A as defined in claim 1.

4,518,590

9α-AZA-9α-HOMOERYTHROMYCIN COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND THERAPEUTIC METHOD

James R. Hauske, East Lyme, and Arthur A. Nagel, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

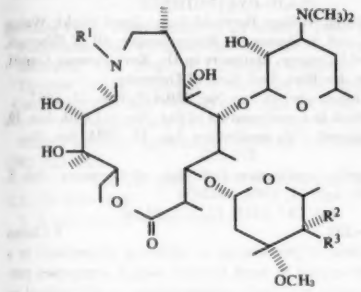
Continuation-in-part of Ser. No. 600,252, Apr. 13, 1984,. This application Jun. 4, 1984, Ser. No. 616,529

Int. Cl.³ A61K *31/70;* C07H *17/08*

U.S. Cl. 514—29 **23 Claims**

22. A method of treating a bacterial infection in a mammalian subject, which comprises administering thereto an antibac-

terially effective amount of a macrolide antibiotic compound of the formula



or a pharmaceutically-acceptable acid-addition salt thereof; wherein

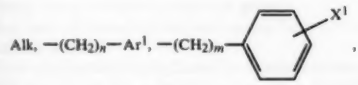
R^1 is selected from the group consisting of hydrogen and methyl; and

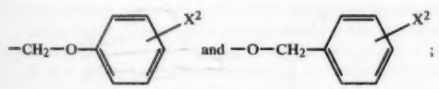
R^2 and R^3 are each selected from the group consisting of hydrogen, NH—CO—R^5 and NH—SO_2—R^6;

provided that one of R^2 and R^3 is always hydrogen, but R^2 and R^3 are not both hydrogen;

wherein:

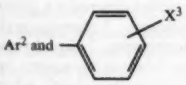
(i) R^5 is selected from the group consisting of





wherein Alk is alkyl having from 1 to 8 carbons; Ar^1 is thienyl, furyl, isoxazolyl, pyridyl, pyrazinyl or pyrimidyl; X^1 is hydrogen, fluoro, chloro, bromo, hydroxy, amino, nitro, trifluoromethyl, alkyl having 1 to 3 carbons or alkoxy having 1 to 3 carbons; X^2 is hydrogen, fluoro, chloro or bromo; n is 0 or 1; and m is 0, 1, 2 or 3; and

(ii) R^6 is selected from the group consisting of



wherein Ar^2 is thienyl or furyl and X^3 is hydrogen, chloro, bromo, or iodo.

4,518,591

HYPOGLYCEMIC AGENTS

Seiu Iida, Tsukui; Tomio Inokuchi, Sagamihara, and Hiroaki Munakata, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 114,326, Jan. 22, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,091

Claims priority, application Japan, Feb. 13, 1979, 54-15303

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. An acylated water extract of *Anemarrhenae rhizoma* in which the acyl moiety is represented by the formula

wherein R is lower alkyl, produced by repeatedly extracting *Anemarrhenae rhizoma* first with an excess of a lower alkyl alcohol until saponin is removed and then with water to give a water extract containing polysaccharides having free hydroxyl groups as a major component thereof, subjecting the water extract to dialysis until low molecular weight components are removed, and acylating the dried water extract with a lower alkyl acid anhydride or halide until at least 8 percent of free hydroxyl groups in the dried extract are acylated.

4,518,592

PROCESS FOR PREPARING MANGIFERIN

Svetlana V. Rusakova, 3, kv. 49, poselok Polyany, Moskovskaya oblast; Vladimir I. Glyzin, ulitsa Shipilovskaya, 29, korpus 2, kv. 255, Moscow; Stepan I. Kocherga, ulitsa Botanicheskaya, 8, kv. 7, p/o Vilar, Moskovskaya oblast; Alla A. Ananieva, Birjulevskaya ulitsa, 5, korpus 2, kv. 463, Moscow, and Larisa F. Libizova, ulitsa Botanicheskaya, 8, kv. 8, p/o Vilar, Moskovskaya oblast, all of U.S.S.R.

Continuation of Ser. No. 283,396, Jul. 15, 1981, abandoned. This application May 16, 1983, Ser. No. 494,138

Claims priority, application U.S.S.R., Jul. 16, 1980, 2960018

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **1 Claim**

1. In a process for the solvent extraction of mangiferin from a plant of the genus Hedysarum, the improvement which comprises comminuting the aerial portion of a plant selected from the species *Hedysarum alpinum L.* and *Hedysarum flavescens Rgl. et. Schmalh* to provide finely divided particles, having a particle size from 2 to 5 mm., treating the said plant particles, at a plant:solvent ratio of from 1:10 to 1:20, with an acetone-water mixture having an acetone:water ratio of 1:0.5 to 2 to extract xanthone glycosides therefrom, concentrating the resulting extract by evaporation to ¼ to 1/6 of its initial volume, filtering the concentrated extract to remove precipitated insolubles, acidifying the resulting filtrate with sulphuric acid to a pH value of from 2 to 4, heating the resulting filtered extract under reflux and, after cooling to room temperature, treating the resulting extract with a non-polar organic solvent selected from the group consisting of chloroform and dichloroethane to form two layers, the upper aqueous layer containing xanthone glycosides, treating the said upper aqueous layer with butanol, to form two layers therefrom, the upper layer of which comprises a solution of xanthone glycoside in butanol, evaporating the solvent from the said upper butanol layer, separating the resulting precipitated mangiferin and recrystallizing the said mangiferin.

4,518,593

INSECTICIDE COMPOSITION FOR USE IN THE FORM OF A SHAMPOO

Pierre Juvin, Neuilly-sur-Seine, and Pierre Moreau, Limoges, both of France, assignors to S.E.R.T.O.G., France

Continuation of Ser. No. 192,800, Oct. 1, 1980, abandoned, which is a continuation of Ser. No. 853,965, Nov. 22, 1977, abandoned. This application Jan. 23, 1984, Ser. No. 572,956

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 **3 Claims**

1. A non-irritating insecticide composition for use in the form of a shampoo which comprises 74–95% by volume of a wetting agent selected from the group consisting of ammonium, triethanolamine and sodium lauryl sulphate, 2 to 12% by volume of acetic acid and 0.5 to 3% by volume of at least one natural or synthetic plant extract or essence selected from the group consisting of extracts and essences of clove, lavender, peppermint, origanum, rosemary, lime, juniper, lemon, citronella, thyme, Datura Stramonium, pine, pyrethrum, pyrethrin

and Ceylon cinnamon leaves, the pH of the composition being less than 4.5.

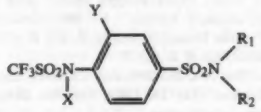
4,518,594

USE OF TRIFLUOROMETHANESULFONANILIDES

Kiyoshi Kasamatsu, Toyonaka, and Hiroyuki Konishi, Sakai, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,265
Int. Cl.³ A01N *51/00*
U.S. Cl. 514—155 **6 Claims**

1. A method for exterminating insects which comprises applying an insecticidally effective amount of a compound of the formula:



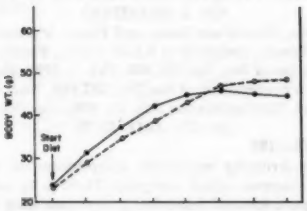
wherein X is a hydrogen atom or a lower alkanoyl, lower alkenoyl or benzoyl group, Y is a hydrogen atom, a lower alkyl group or a halogen atom and R_1 and R_2, which may be same or different, are each a hydrogen atom, a lower alkyl group, a cyclo(lower)alkyl group, a lower alkenyl group, a lower alkynyl group, a lower alkoxy group or an acyl group selected from the group consisting of a lower alkanoyl, a lower alkenoyl and a benzoyl group, provided that R_1 and R_2 are not simultaneously a hydrogen atom or an acyl group, to said insects.

4,518,595

METHOD FOR TREATING DIABETES USING DHEA COMPOUNDS

Douglas L. Coleman, Seal Harbor, Me.; Norman Applezweig, New York, N.Y.; and Edward H. Leiter, Otter Creek, Me. assignors to The Jackson Laboratory, Bar Harbor, Me.

Filed Jul. 19, 1983, Ser. No. 515,354
Int. Cl.³ A61K *31/56*
U.S. Cl. 514—178 **20 Claims**



1. A method for treating diabetes and enhancing the pancreatic beta cell function of diabetics comprising administering a DHEA compound selected from the group consisting of dehydroepiandrosterone (DHEA), DHEA sulfate, and soluble compounds of DHEA.

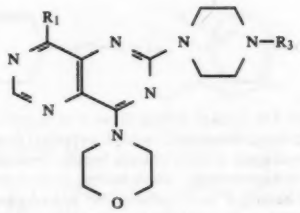
4,518,596

ANTITHROMBOTIC USE OF 2-(PERHYDRO-1,4-DIAZINO)-PYRIMIDO (5,4,D)-PYRIMIDINES

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 350,429, Feb. 22, 1982, abandoned, which is a continuation of Ser. No. 161,010, Jun. 19, 1980, abandoned. This application Jan. 31, 1984, Ser. No. 575,333
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926804; Apr. 11, 1980, 3013930
Int. Cl.³ A61K *31/535, 31/54*
U.S. Cl. 514—232 **5 Claims**

1. The method of preventing or relieving thrombosis in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antithrombotic amount of a compound of the formula



wherein

R_1 is methoxy; ethoxy; 2-hydroxy-ethoxy; (alkyl of 1 to 8 carbon atoms)mercapto; cyclohexylmercapto; phenethylmercapto; 1-phenylethyl-mercapto; 3-phenylpropyl-mercapto; 2-diethylaminoethyl-mercapto; 1-naphthylmethylmercapto, furfuryl-mercapto; 2-indanyl-mercapto; (unsubstituted or mono-substituted phenyl)mercapto, where the substituent is fluorine, chlorine, bromine, methyl, hydroxyl, methoxy or amino; (unsubstituted or mono-substituted benzyl)mercapto, where the substituent is attached to the phenyl moiety and is fluorine, chlorine, methyl, hydroxyl, methoxy, nitro or trifluoromethyl; dichlorobenzyl-mercapto; methylenedioxybenzyl-mercapto; dimethoxybenzyl-mercapto; thiomorpholino; thiomorpholino-1-oxide; (unsubstituted or mono-hydroxy-substituted alkyl of 1 to 4 carbon atoms)-amino; N,N-di(unsubstituted or mono-hydroxy-substituted alkyl of 1 to 4 carbon atoms)-amino; phenyl(alkyl of 1 to 4 carbon atoms)-amino; N-(alkyl of 1 to 4 carbon atoms)-phenyl-(alkyl of 1 to 4 carbon atoms)-amino; phenyl-amino; or N-(alkyl of 1 to 4 carbon atoms)-phenylamino; and

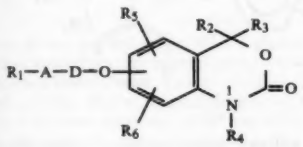
R_3 is hydrogen; formyl; 2-furoyl; or 2-thenoyl; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,518,597
SUBSTITUTED BENZOXAZIN-2-ONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Berthold Narr; Josef Nickl; Erich Müller; Josef Roch; Walter Haarmann, and Johannes-Maximilian Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Continuation of Ser. No. 489,216, Apr. 27, 1983, abandoned.
This application Jun. 6, 1984, Ser. No. 617,797
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217012
Int. Cl.[3] A61K *31/535;* C07D *265/18*
U.S. Cl. 514—228 13 Claims

1. A compound of the formula



(I)

wherein

A is a sulfur atom or an SO, SO_2, R—N=S, or R—N=SO group where R is a hydrogen atom or a benzoyl or phenylsulfonyl group, optionally substituted by a methyl group, or an acetyl or propionyl group;

D is a linear or branched alkylene group having from 2 to 6 carbon atoms;

R_1 is an alkyl group having from 1 to 3 carbon atoms, optionally substituted by a phenyl group, or a phenyl group, each phenyl group being optionally substituted by an alkyl group having from 1 to 4 carbon atoms, a halogen atom, an alkoxy group having from 1 to 3 carbon atoms, a hydroxyl group, a cyclohexyl group, a phenyl group, an amino group, or an alkanoylamino group having from 1 to 3 carbon atoms; an alkyl group having from 4 to 8 carbon atoms; a cycloalkyl group having from 3 to 7 carbon atoms; a di-substituted or tri-substituted phenyl group of a mono-substituted or di-substituted hydroxyphenyl or aminophenyl group, the substituents, which may be the same or different, being selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, alkoxy groups having from 1 to 3 carbon atoms, and halogen atoms; a pyridyl-N-oxide group; or a 5-membered or 6-membered aromatic ring, optionally substituted by one or two alkyl groups each having from 1 to 3 carbon atoms, the aromatic ring containing from 1 to 3 nitrogen atoms or 1 nitrogen atom and 1 sulfur atom, while a phenyl group may optionally be fused onto the aromatic ring via two adjacent carbon atoms;

R_2 and R_3, which may be identical or different, are each a hydrogen atom, phenyl group, alkyl group having from 1 to 6 carbon atoms, or cycloalkyl group having from 3 to 7 carbon atoms;

R_4 is a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms;

R_5 is a hydrogen or halogen atom, a nitro group, or an alkyl group having from 1 to 3 carbon atoms; and

R_6 is a hydrogen or halogen atom or an alkyl group having from 1 to 3 carbon atoms.

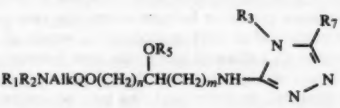
11. A method for the prophylaxis or treatment of thromboembolic diseases, for the treatment of arteriosclerosis, or for the prophylaxis of metastasis in a warm-blooded animal or human in need of such treatment which comprises perorally, parenterally, or rectally administering to said animal or human an effective amount of a compound of claim 1.

4,518,598
1,2,4-TRIAZOLE-3-AMINES, THEIR PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Roger Hayes; David E. Bays; John W. M. Mackinnon; Linda Carey, and Philip Blatcher, all of Hertfordshire, England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 401,397, Jul. 23, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 569,151
Claims priority, application United Kingdom, Feb. 23, 1982, 8205596
Int. Cl.[3] A61K *31/41;* C07D *249/14*
U.S. Cl. 514—212 6 Claims

1. A compound of formula (I)



(I)

or a physiologically acceptable salt or hydrate thereof, in which

R_1 represents hydrogen, C_{1-14} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, ar C_{1-6} alkyl, trifluoro C_{1-6} alkyl, heteroaralkyl, or C_{1-6} alkyl substituted by C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino or di C_{1-6} alkylamino; and

R_2 represents hydrogen or a C_{1-4} alkyl group;

or R_1 and R_2 together with the nitrogen atom to which they are attached form piperidino, morpholino, 4-methyl piperidino, pyrrolidino, hexamethyleneimino or tetrahydropyridino;

Alk represents a straight or branched alkylene chain of 1 to 3 carbon atoms;

Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_5 represents hydrogen or acyl;

n and m, which may be the same or different, are each 1 or 2; and

R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, hydroxy C_{2-6} alkyl, C_{1-6} alkoxy C_{2-6} alkyl or C_{1-4} alkanoyloxy C_{2-6} alkyl;

R_7 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, C_{1-6} alkoxy C_{1-6} alkyl, acyloxy C_{1-6} alkyl, C_{1-6} alkylthio C_{1-6} alkyl, arylthio C_{1-6} alkyl, aryloxy C_{1-6} alkyl, ar C_{1-6} alkyloxy C_{1-6} alkyl, or the group $(CH_2)_qR_6$ where q is zero, 1, 2, 3, 4, 5, or 6 and the alkylene chain $(CH_2)_q$ may be straight or branched; and

R_6 is hydroxy, C_{1-6} alkoxy, nitro, heteroaryl, tetrahydropyranyloxy, or $CH_2NHC(=X)NHR_9$ where X represents NCN, NSO_2 Methyl, NSO_2 Phenyl or $CHNO_2$ and R_9 is C_{1-6} alkyl;

or R_6 is the group $NR_{10}R_{11}$, where R_{10} is hydrogen or C_{1-6} alkyl; and R_{11} is hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, aryl, ar C_{1-6} alkyl, or heteroaralkyl, or R_{11} is the group SO_2R_{12} where R_{12} is C_{1-6} alkyl or aryl; or R_{11} is the group COR_{13} where R_{13} is hydrogen, C_{1-6} alkyl, aryl, ar C_{1-6} alkyl, C_{1-6} alkoxy, halomethyl, heteroaryl, heteroaralkyl or the group NHR_{14} where R_{14} is hydrogen, C_{1-6} alkyl, C_{3-8} cycloalkyl, aryl or ar C_{1-6} alkyl; or R_{10} and R_{11} together represent the group $=CR_{15}R_{16}$ where R_{15} represents aryl or heteroaryl and R_{16} represents hydrogen or C_{1-6} alkyl;

or R_6 is the group SO_2R_{17} in which R_{17} is hydroxy, C_{1-6} alkyl, aryl or the group $NR_{18}R_{19}$ where R_{18} and R_{19}, which may be the same or different, each represents hydrogen or C_{1-6} alkyl;

or R_6 is the group COR_{20} where R_{20} is hydrogen, hydroxy, C_{1-6} alkoxy, aryloxy, ar C_{1-6} alkyloxy, C_{1-6} alkyl, aryl, ar C_{1-6} alkyl, or the group $NR_{21}R_{22}$ where R_{21} is hydrogen or C_{1-6} alkyl optionally substituted by a hydroxy or C_{1-6} alkoxy group; and R_{22} is hydrogen, C_{1-6} alkyl (optionally substituted by a hydroxy or C_{1-6} alkoxy group), C_{3-6} alkenyl, aryl,

ar C_{1-6} alkyl or C_{3-8} cycloalkyl, or $NR_{21}R_{22}$ forms a pyrrolidino ring which may be optionally substituted by hydroxy or one or two C_{1-3} alkyl groups; or R_6 is the group $CR_{23}{=}NR_{24}$ where R_{23} is hydrogen, C_{1-6} alkyl, aryl or ar C_{1-6} alkyl and R_{24} is hydroxy, C_{1-6} alkoxy, ar C_{1-6} alkyloxy or —NHC(=Y)NH_2 where Y is oxygen or sulphur;

or R_3 and R_7 taken together represent $-(CH{=}CH)_2-$ or $-(CH_2)_4-$;

with the proviso that when the group R_6 contains a carbon atom through which it is linked to the alkylene group $(CH_2)_q$ then the total number of carbon atoms in the resulting chain is not greater than 6, that is, q is not greater than 5; and wherein the term aryl as a group or part of a group means phenyl or phenyl substituted with one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; the term acyl or the acyl portion of an acyloxyalkyl group means an aroyl, aralkanoyl or C_{1-6} alkanoyl group; the term heteroaryl as a group or part of a group means thienyl, pyrrolyl, pyridyl, furyl or thiazolyl, the heteroaryl ring may be unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy C_{1-6} alkyl, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di C_{1-6} alkylamino C_{1-6} alkyl or halogen, the alkyl portion of a heteroaralkyl group is a straight or barnched C_{1-4} alkyl chain, and the heteroaryl ring is linked to the alkyl portion through a carbon atom.

6. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as claimed in claim 1 to relieve said condition.

4,518,599

2-AMINO-3-CYANO-5-HALO-6-(SUBSTITUTED)PYRAZINE

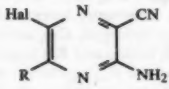
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1982, Ser. No. 430,917

Int. Cl.³ C07D *241/16, 241/18;* A01N *43/60*

U.S. Cl. 514—255 **10 Claims**

1. A method of inhibiting the growth of bacteria and fungi comprising contacting said bacteria and fungi with a bactericidally and fungicidally effective amount of a compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine; and

R is mono- or di-, or substituted mono- or di-, loweralkylamino, wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; thiocyano; mercapto; straight or branched chain C^{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; phenylthio; loweralkylsulfoxy; or loweralkylsulfonyl.

4,518,600

COMBATING FUNGI WITH 1-PHENOXY-2-PYRIMIDINYL ALKANOLS

Graham Holmwood, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

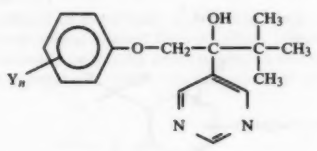
Continuation of Ser. No. 937,650, Aug. 28, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,636

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742173

Int. Cl.³ A61K *31/505;* C07D *239/26*

U.S. Cl. 514—256 **7 Claims**

1. A 1-phenoxy-2-pyrimidinyl-alkanol of the formula



in which

Y is fluorine, chlorine, methyl, methoxy or benzyloxy, and

n is 0, 1 or 2.

5. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,518,601

2-(3-PYRIDYL)-1,3,4-OXADIAZOLES AND USE THEREOF IN PEST CONTROL

Odd Kristiansen, Möhlin, and Jozef Drabek, Oberwil, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

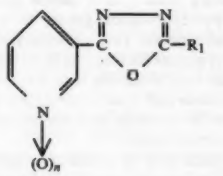
Filed Jun. 9, 1983, Ser. No. 502,859

Claims priority, application Switzerland, Jun. 16, 1982, 3724/82

Int. Cl.³ A61K *31/42;* C07D *413/04*

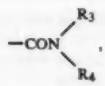
U.S. Cl. 514—340 **10 Claims**

1. A compound of the formula



in which:

R_1 is hydrogen, C_1–C_3alkyl, —$COOR_2$ or



wherein

R_2 is methyl or ethyl

R_3 and R_4, each independently of the other, are hydrogen, methyl or ethyl, and

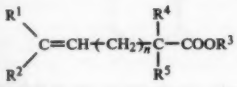
n is 0 or 1.

4,518,602
VINYL CARBOXYLIC ACID DERIVATIVES, THEIR PRODUCTION AND USE AS INHIBITORS OF THROMBOXANE SYNTHETASE

Shinji Terao, Toyonaka, and Kohei Nishikawa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

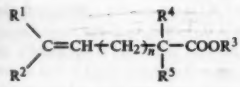
Filed Sep. 30, 1983, Ser. No. 537,862
Claims priority, application Japan, Oct. 7, 1982, 57-176918; Dec. 1, 1982, 57-211753
Int. Cl.³ A61K *31/44;* **C07D** *211/82, 213/55, 407/06*
U.S. Cl. 514—332 **17 Claims**

1. A compound of the formula:



wherein R^1 is a pyridyl group; R^2 is a phenyl, thienyl, furyl, naphthyl, benzothienyl or pyridyl group which may have as a substituent a lower alkoxy, a lower alkyl, a halogen, trifluoromethyl, a lower alkenyl or methylenedioxy; R^3 is hydrogen, benzyl or a lower alkyl; one of R^4 and R^5 is hydrogen or a lower alkyl, and the other is an aryloxy, or a lower aliphatic hydrocarbon, an alicyclic hydrocarbon having not more than 6 carbon atoms or an aromatic group which may have a substituent, or a group represented by the formula, $—S(O)_m—R^6$ (in which R^6 is phenyl or a lower alkyl group; m is an integer of 0 to 2), or R^4 and R^5 each combine with the other to represent one alkylene group; and n is an integer of 2 to 6, or a pharmaceutically acceptable salt thereof.

13. A pharmaceutical composition suitable for inhibiting activity of thromboxane A_2 synthetase in a mammal, which comprises, as an active ingredient, an effective amount of a compound of the formula:



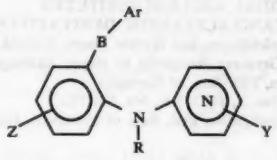
wherein R^1 is a pyridyl group; R^2 is a phenyl, thienyl, furyl, naphthyl, benzothienyl or pyridyl group which may have as a substituent a lower alkoxy, a lower alkyl, a halogen, trifluoromethyl, a lower alkenyl or methylenediozy; R^3 is hydrogen, benzyl or a lower alkyl; one of R^4 and R^5 is hydrogen or a lower alkyl, and the other is an aryloxy, or a lower aliphatic hydrocarbon, an alicyclic hydrocarbon having not more than 6 carbon atoms or an aromatic group which may have a substituent, or a group represented by the formula, $—S(O)_m—R^6$ (in which R^6 is phenyl or a lower alkyl group; m is an integer of 0 to 2), or R^4 and R^5 each combine with the other to represent one alkylene group; and n is an integer of 2 to 6, or a pharmaceutically acceptable salt thereof, and a pharmaceutical acceptable carrier or excipient therefor.

4,518,603
[2-[(NITROPYRIDINYL)AMINO]PHENYL]ARYLMETHANONES IN A PROCESS FOR PREPARING PYRIDO[1,4]BENZODIAZEPINES

Young S. Lo, Richmond, and Chandler R. Taylor, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 431,997, Sep. 30, 1982, Pat. No. 4,480,100. This application Dec. 23, 1983, Ser. No. 541,215
Int. Cl.³ A61K *27/00, 31/38, 31/40, 31/44, 31/495*
U.S. Cl. 514—352 **12 Claims**

1. A method of treating depression which comprises administering internally to an animal an effective amount of a compound having the formula:



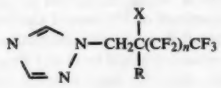
wherein;
R is —alk¹—Q;
Q is hydrogen or $—NR^1R^2$;
—alk¹ is a straight or branched hydrocarbon chain containing 1–8 carbons;
B is carbonyl or thionomethyl;
R^1 and R^2 are selected from the group consisting of hydrogen and loweralkyl;
Ar is selected from the group consisting of phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro which may be the same or different;
Y is selected from the group consisting of hydrogen or 1–2 radicals selected from loweralkyl, hydroxy or loweralkoxy and may be the same or different;
Z is selected from the group consisting of hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy or nitro or the pharmaceutically acceptable acid addition salts thereof.

4,518,604
ANTIFUNGAL 1-ARYL-2-(1H-1,2,4-TRIAZOL-1YL)-1-PERFLUOROALKYLETHYL HALIDES

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 517,141, Jul. 25, 1983, abandoned. This application Oct. 27, 1983, Ser. No. 546,128
Int. Cl.³ A01N *43/64;* **A61K** *31/41;* **C07D** *249/08, 401/06*
U.S. Cl. 514—340 **14 Claims**

1. A compound of the formula



(I)

or a pharmaceutically or agriculturally acceptable acid addition salt thereof, wherein R is 5-chloro-2-pyridyl, trifluoromethylphenyl or phenyl substituted by 1 to 3 substituents each independently selected from F, Cl and Br; n is zero or an integer of from 1 to 5; and X is F, Cl or Br.

13. A method of treating a fungal infection in an animal in need of such treatment which comprises administering to said animal an antifungal amount of a compound or pharmaceutically acceptable salt thereof according to claim 1.

14. A method of treating a fungal infection in a plant or seed in need of such treatment which comprises administering to said plant or seed an antifungal amount of a compound or agriculturally acceptable salt thereof according to claim 1.

4,518,605
FUNGICIDAL AZOLE-SUBSTITUTED OXIMINO-CYANO-ACETAMIDE DERIVATIVES

Wilhelm Brandes, Leichlingen, and Werner Daum, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

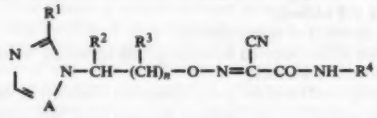
Filed Jun. 3, 1983, Ser. No. 500,732

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3222961

Int. Cl.³ A01N *43/50, 43/64;* **C07D** *233/61, 249/08*

U.S. Cl. 514—383 **11 Claims**

1. An azole-substituted oximino-cyano-acetamide derivative of the formula



in which

R^1 and R^3 each independently is hydrogen or alkyl having up to 3 carbon atoms,

R^2 is hydrogen, alkyl having up to 6 carbon atoms, or halogenoalkyl having up to 2 carbon atoms and up to 5 halogen atoms,

R^4 is hydrogen or CO—NH—R^5,

R^5 is hydrogen, cycloalkyl having 3 to 7 carbon carbon atoms, or alkyl having up to 8 carbon atoms and optionally substituted by cyano, hydroxycarbonyl, aminocarbonyl, alkoxy and/or alkoxycarbonyl, each having up to 4 carbon atoms in the alkyl part,

A is N or CH, and

n is 0 or 1.

10. A method of combating fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim **1**.

4,518,606
PHARMACEUTICAL COMPOSITIONS

Edmond Salas, Moulineaux, France, assignor to Beecham Group Limited, England

Continuation of Ser. No. 204,847, Nov. 7, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,711

Claims priority, application United Kingdom, Nov. 8, 1979, 7938767

Int. Cl.³ A61K *31/43*

U.S. Cl. 514—197 **3 Claims**

1. An antibiotic pharmaceutical composition adapted for intramuscular injection which comprises an aqueous sterile solution in the proportions of 3% benzyl alcohol, and 1 gram of amoxycillin or a salt thereof, said composition upon injection providing an enhanced blood level and a more rapid peak level of amoxycillin than the same solution without benzyl alcohol.

4,518,607
MALE ORAL CONTRACEPTIVE N-ALKYLIMIDAZOLE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

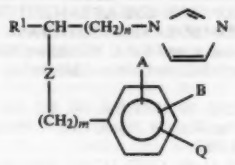
Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 18, 1983, Ser. No. 514,409

Int. Cl.³ C07D *233/60;* **A61J** *31/415*

U.S. Cl. 514—399 **25 Claims**

1. A compound of the formula



(I)

and the acid addition salts thereof wherein

Z is oxygen or sulfur;

m is 0, 1, 2 or 3;

n is 1, 2 or 3;

R^1 is

(a) hydrogen;

(b) alkyl;

(c) cycloalkyl optionally substituted by one or more lower alkyl;

(d) cycloalkyl-lower-alkyl;

(e) phenyl;

(f) phenyl-lower-alkyl;

wherein the phenyl ring in (e) and (f) is optionally substituted by one or more halo, lower alkyl, lower alkoxy, lower alkylthio, cyano or trifluoromethyl;

(g) naphthyl; or

(h) naphthyl-lower-alkyl

A and B are independently hydrogen, halo, lower alkyl or lower alkoxy and either one of A or B may be nitro, amino or alkanoylamino;

Q is NR^2R^3 wherein

R^2 is hydrogen; alkyl; cycloalkyl optionally substituted by one or more lower alkyl; cycloalkyl-lower-alkyl; phenyl or phenyl-lower-alkyl wherein the phenyl ring is optionally substituted by one or two halo, lower alkyl or lower alkoxy; and R^3 is hydrogen or lower alkyl;

with the proviso that when R^1 is optionally substituted phenyl, Z is oxygen, n is 1 and m is 0, 1 or 2, Q is not amino unless A or B is alkanoylamino; and that when R^1 is optionally substituted phenyl, Z is sulfur, m is 0 and n is 1, Q is not amino.

25. A method of male oral contraception which comprises orally administering an oral contraceptively effective amount of a compound of claim **1** to a male mammal.

4,518,608
WATERSOLUBLE DERIVATIVES OF NON-STEROIDAL ANTI-INFLAMMATORY AGENTS AND A PROCESS FOR THE PRODUCTION THEREOF

Agostne Kahan, Budapest, Hungary, assignor to Medimpex Gyogyszerkuelkereskedelmi Vaallalat, Budapest, Hungary

Continuation of Ser. No. 189,008, Sep. 22, 1980, abandoned. This application Apr. 20, 1983, Ser. No. 486,861

Claims priority, application Hungary, Sep. 27, 1979, KA 1539

Int. Cl.³ A61K *31/40*

U.S. Cl. 514—420 **5 Claims**

1. A water-soluble, analgesic, anti-inflammatory, antipyretic or antiphlogistic pharmaceutical composition suitable for parenteral administration comprising an analgestic, anti-inflammatory, antipyretic or antiphlogistic effecitve amount of indomethacin and a hydrophilic compound selected from the group which consists of TRIS, BIS-TRIS, BIS-TRIS-PROPANE, TAPS, TES, TRICINE and mixtures thereof.

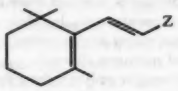
3. An analgesic, anti-inflammatory, antipyretic or antiphlogistic method of treatment which comprises the step of parenterally administering to an animal subject in need of analgesic, anti-inflammatory, antipyretic and antiphlogistic treatment, an analgesic, anti-inflammatory, antipyretic or antiphlogistic effective amount of the water-soluble pharmaceutical composition defined in claim **1**.

4,518,609
NAPHTENIC AND HETEROCYCLIC RETINOIC ACID ANALOGUES

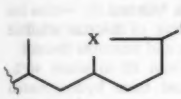
Marcia I. Dawson, Los Altos, and Rebecca L. S. Chan, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 434,622, Oct. 15, 1982, Pat. No. 4,456,618. This application Apr. 12, 1984, Ser. No. 599,665
Int. Cl.³ A61K *31/38, 31/34*
U.S. Cl. 514—448 20 Claims

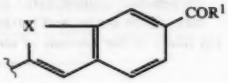
1. A compound of the formula:



where Z is



, or



and X is a chalcogen atom of atomic number 8 or 16, R^1 is hydroxyl, alkoxy, aroxy, or NR^2R^3 where R^2 is hydrogen, alkyl, or aryl and R^3 is alkyl or aryl.

4,518,610
MICROBICIDAL/MICROBISTATIC COMPOSITIONS AND USE THEREOF EMPLOYING MIXTURES OF 4,5-DICHLORO-1,2-DITHIOL-3-ONE AND ALKYLENEBISTHIOCYANATE

Osamu Umekawa, Kaizuka, and Sakae Katayama, Kobe, both of Japan, assignors to Katayama Chemical Works Co., Ltd. and Yoshitomi Pharmaceutical Industries, Ltd., both of Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 327,011
Claims priority, application Japan, Dec. 13, 1980, 55-176095
Int. Cl.³ A61K *31/385;* D21D *3/00*
U.S. Cl. 514—516 12 Claims

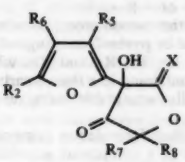
1. A bactericidal or bacteriostatic composition for industrial use comprising 4,5-dichloro-1,2-dithiol-3-one and methylenebisthiocyanate wherein the ratio of 4,5-dichloro-1,2-dithiol-3-one to methylenebisthiocyanate is of from about 1:0.3 to 1:16.

4,518,611
2-FURYLBUTYROLACTONE MODULATION OF THE IMMUNE SYSTEM IN MAMMALS

Robert W. Veltri, West Chester, Pa., assignor to National Foundation for Cancer Research, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 481,998, Apr. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 449,584, Dec. 14, 1982, abandoned. This application Sep. 29, 1983, Ser. No. 536,995
Int. Cl.³ A61K *31/34, 31/335*
U.S. Cl. 514—470 16 Claims

1. A method for modulating in stimulation or suppression mode the lymphocyte system of mammals comprising administering a composition comprising a modulatorily effective amount of a compound of the formula:



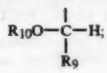
wherein:

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_5 and R_6 are selected from the group consisting of hydrogen and lower alkyl and may be the same or different;

R_8 is selected from the group consisting of hydrogen and lower alkyl;

R_7 is hydrogen, lower alkyl or



R_9 is CH_2OH

R_{10} is hydrogen;

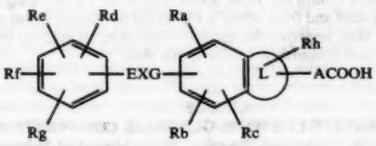
when R_7 contains a hydroxyl group in the α or β position, R_7 may form the hemiketal ring closure at carbon 3 of the butyrolactone with protonation of the carbonyl group on the same carbon atom and X is selected from the group consisting of O, S and NH the low dosage corresponding to the stimulatory mode of modulation and the high dosages corresponding to the suppression mode of modulation and a pharmaceutically acceptable carrier therefor.

4,518,612
NAPHTHALENE AND 2-OXO-BENZOPYRAN ACIDS AND DERIVATIVES AND PHARAMACEUTICAL USE THEREOF

John R. Bantick, Loughborough; John Fuher, Alvaston; David N. Hardern, and Thomas B. Lee, both of Loughborough, all of England, assignors to Fisons plc, Ipswich, England

Division of Ser. No. 359,817, Mar. 19, 1982, Pat. No. 4,424,231. This application Dec. 21, 1983, Ser. No. 563,709
Claims priority, application United Kingdom, Mar. 24, 1981, 8109090; Jul. 1, 1981, 8120255
Int. Cl.³ A61K *31/19, 31/35;* C07C *65/11;* C07D *311/12*
U.S. Cl. 514—457 11 Claims

1. A compound of formula I,



I

in which

Ra, Rb, Rc, Rd, Re, Rf and Rg, which may be the same or different, each represent hydrogen, amino, hydroxy, alkoxy, alkenyloxy, halogen, acyl, alkenyl, alkyl, or alkoxy substituted by phenyl,

Rh is hydrogen, alkyl or —COOH,

X is a hydrocarbon chain containing from 2 to 10 carbon atoms and optionally substituted by a hydroxy group,

A has no significance or represents Y, OY, or SY and Y represents a C 1 to 4 hydrocarbon chain which is optionally substituted by alkyl C 1 to 4,

E and G, which may be the same or different, each represent

—O—, —S— or —CH_2—, provided that at least one of E and G is —O— or —S—,

L, together with the carbon atoms to which it is attached, forms a benzene or pyran-2-one ring,

Ra, Rb, Rc, Rd, Re, Rf, Rg and Rh, when they contain carbon, each containing less than 7 carbon atoms,

and pharmaceutically acceptable salts, esters and amides thereof.

10. A pharmaceutical formulation comprising an effective anti SRS-A amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable adjuvant, diluent or carrier.

4,518,613

THIOALKANOYL-CARNITINES, PROCESS FOR THEIR PREPARATION AND MUCOLYTIC PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Claudio Cavazza, 35, Via Marocco, Rome, Italy (00144), and Maria O. Tinti, 81, Via Ernesto Basile, Rome, Italy (00180)

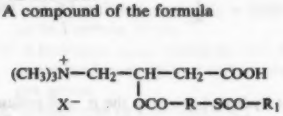
Filed Oct. 22, 1982, Ser. No. 436,190

Claims priority, application Italy, Dec. 3, 1981, 49835 A/81

Int. Cl.³ A61K *31/265;* **C07C** *153/017*

U.S. Cl. 514—513 **6 Claims**

1. A compound of the formula



wherein

R is a straight alkylene radical having from 2 to 6 carbon atoms, or is a branched alkylene radical having from 3 to 6 carbon atoms,

R_1 is a straight or branched lower alkyl radical having from 1 to 4 carbon atoms, and

X^- is a halogen anion.

5. A pharmaceutical composition possessing mucolytic and antitussive activities, comprising a therapeutically effective amount of at least one of a compound according to claim 1 as active component plus an inert diluent.

4,518,614

COSMETIC PREPARATION

Richard W. Parkinson, Orem, Utah, assignor to Redken Laboratories, Inc., Canoga Park, Calif.

Continuation-in-part of Ser. No. 439,113, Nov. 4, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,654

Int. Cl.³ A61K *47/00, 31/365*

U.S. Cl. 514—2 **6 Claims**

1. In a cosmetic skin composition comprising a creme, lotion, emulsion or liquid water base preparation wherein the improvement comprises from about 0.01% to 1% by weight gibberellic acid and from about 0.1% to 5% by weight lysine to soften the skin, improve the texture of the skin, moisturize the epidermis and diminish wrinkles in the skin.

4,518,615

NON-ADHESIVE CHEWING GUM BASE COMPOSITION

Subraman R. Cherukuri, Towaco; Ellen Marschall-Helman, Somerset, both of N.J., and Frank T. Hriscisce, Astoria, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 23, 1983, Ser. No. 525,774

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—4 **20 Claims**

1. A non-adhesive chewing gum base composition, consisting essentially of, in weight percent

(a) elastomer in the amount of about 10 to about 30%, wherein the elastomer is selected from the group consisting of synthetic gums, synthetic elastomers, natural gums, natural elastomers and mixtures thereof,

(b) elastomer solvent in the amount of about 2 to about 18%, wherein the elastomer solvent is selected from the group consisting of pentaerythritol ester of partially hydrogenated wood rosin, pentaerythritol ester of wood resin, glycerol ester of partially dimerized rosin, glycerol ester of polymerized rosin, glycerol ester of tall oil rosin, glycerol ester of wood resin and partially hydrogenated wood rosin and partially hydrogenated methyl ester of rosin; terpene resins including polyterpene and polymers of α-pinene or β-pinine and mixtures thereof,

(c) polyvinyl acetate having a medium average molecular weight of 15,000 to 30,000 in the amount of about 15 to about 45%,

(d) an emulsifier in the amount of about 2.0 to about 10%, wherein the emulsifier is selected from the group consisting of glycerol monostearate, lecithin, fatty acid monoglycerides, diglycerides, triglycerides, propylene glycol monostearate and mixtures thereof,

(e) low molecular weight polyethylene having an average molecular weight of at least 2,000 in the amount of about 0.5 to about 15%,

(f) waxes having a melting point above about 170° F. in the amount of about 0.5 to about 10%, wherein the waxes are selected from the group consisting of microcrystalline wax, natural wax, petroleum wax and mixtures thereof,

(g) plasticizer in the amount of about 10 to about 40%, wherein the plasticizer is selected from hydrogenated vegetable oils, partially hydrogenated vegetable oils, hydrogenated animal fats, partially hydrogenated animal fats, cocoa butter and mixtures thereof, and

(h) fillers in the amount of about 0 to about 5%.

4,518,616

PROCESS FOR RECOVERING THE WHEY PROTEINS, THE APPLICATION THEREOF TO CHEESE-MAKING AND THE RESULTING CHEESES

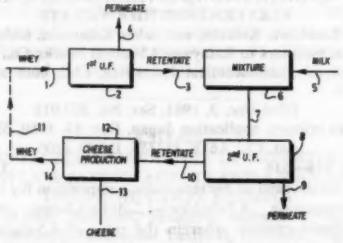
Joseph Czulak, South Yarra, Australia, assignor to Institut National de la Recherche Agronomique, Paris, France

Filed Nov. 24, 1982, Ser. No. 444,066

Claims priority, application Australia, Nov. 24, 1981, 1682/81

Int. Cl.³ A23C *19/05, 21/06, 9/142*

U.S. Cl. 426—40 **5 Claims**



1. A process for utilizing recovered whey protein in cheese making which consists essentially of the following steps:

(a) pasturizing the whey, then

(b) ultrafiltering the whey to provide a whey protein concentrate at a concentration ratio of at least 3.5, then

(c) mixing the whey protein concentrate from step (b) with full cream milk or skim milk or a mixture of the two to produce a protein enriched milk product, at a volume ratio of 2 to 5 milk to concentrate, then carrying out the following two steps (d) and (e) to produce an enriched curd:

(d) ultrafiltering the protein enriched milk product to a concentration ratio of at least 3.5 and

(e) curdling the casein contained in said protein enriched milk product with milk clotting enzyme thereby to produce curd and

(f) separating the curd as a cheese product, the amount of

whey protein in the concentrate added to the milk in step (c) being such that the total whey protein is at most 45% of the weight of the total proteins in the cheese produced in step (f) and the whey protein is retained in the soluble state in the curd, the fat content of the cheese product consisting essentially of that supplied by the above-named whey concentrate and milk admixed in step (c).

4,518,617

PROCESS FOR CONTINUOUSLY MAKING AN ENDLESS WAFER LAMINATE OF UNIFORM WIDTH, CONSISTING OF INDIVIDUAL WAFER SHEET LAYERS AND INTERVENING CREAM LAYERS

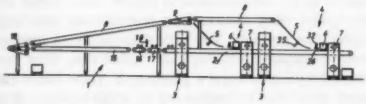
Franz Haas, Sr., Gerstlgasse 25, A-1210 Wien; Franz Haas, Jr., Kreuzgasse, A-2100 Leobendorf, and Johann Haas, Seitweg 4, A-3400 Klosterneuburg, all of Austria

PCT No. PCT/AT82/00017, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/03969, PCT Pub. Date Nov. 25, 1982

PCT Filed May 19, 1982, Ser. No. 432,931

Int. Cl.³ A21D *6/00*; G01N *33/02*

U.S. Cl. 426—231 **21 Claims**



1. In a process for the continuous production of an endless wafer sheet laminate of uniform width, which comprises the steps of forming a first lowermost layer of wafer sheets on a conveyor moving in a direction of conveyance, each one of the wafer sheets having a leading and a trailing edge in said direction of conveyance, said edges extending transversely to said direction, said first layer consisting of consecutive wafer sheets whose trailing and leading edges adjoin, applying a composition layer to said first layer, applying an additional wafer sheet layer to said composition layer, each one of the wafer sheets of the additional layer having a leading and a trailing edge in said direction of conveyance, said edges extending transversely to said direction, said additional layer consisting of consecutive wafer sheets whose trailing and leading edges adjoin, and alternately applying additional ones of the composition layers and of said additional wafer sheet layers until the wafer sheet laminate has been produced, wherein the improvement comprises successively supplying the wafer sheets for the first layer to the conveyor, sensing one of said edges of each one of said wafer sheets of the first layer, moving each one of the wafer sheets for each one of the additional layers to a waiting position disposed above an uncovered uppermost one of said composition layers of a previously formed portion of the wafer laminate, and dropping each one of the wafer sheets from said waiting position at a time determined by the sensing of said one edge of a respective one of the wafer sheets of the first layer whereby said dropped wafer sheet falls onto the uppermost composition layer into a predetermined position relative to the wafer sheets of the first layer.

4,518,618

FOOD COATING COMPOSITIONS FOR FOODS COOKED BY MICROWAVE

Samson T. Hsia, Fremont, and Pam Ogasawara, Oakland, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Feb. 12, 1982, Ser. No. 348,248

Int. Cl.³ A23L *1/272*

U.S. Cl. 426—262 **13 Claims**

1. A method for crisping and browning the surfaces of foods comprising

coating said foods with a food coating formulation containing flour, cornstarch, corn meal, bread crumbs, bran flour or flakes, and a combination of three salts selected from the group consisting of potassium acetate, potassium chloride, potassium bicarbonate, potassium citrate, potassium dibasic phosphate, sodium acetate, sodium chloride, sodium bicarbonate, and sodium dibasic phosphate, wherein said three salts are added in substantially equal amounts and comprise at least 5% by weight of the food coating; and

cooking said foods with microwave energy for a time period sufficient to crisp and brown said surfaces of said foods.

4,518,619

PREPARATION OF SMOKE TREATED, STUFFED FOOD CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 466,534, Feb. 15, 1983, abandoned, which is a continuation of Ser. No. 249,445, Mar. 31, 1981, abandoned, which is a continuation of Ser. No. 062,358, Jul. 31, 1979, abandoned. This application Aug. 31, 1983, Ser. No. 527,984

Int. Cl.³ A22C *11/00, 13/00*

U.S. Cl. 426—265 **38 Claims**

1. A method for manufacturing food products encased in a tubular cellulosic food casing consisting of the steps of (a) treating the external surface of a tubular cellulosic food casing, selected from the group consisting of a non-fibrous dry stock casing and a fibrous dry stock casing, with a substantially tar-depleted aqueous liquid smoke composition consisting of a mixture of smoke coloring and smoke flavoring constituents, including acids, phenols, and carbonyls derived from natural wood, until said casing has incorporated therein said smoke coloring and smoke flavoring constituents in an amount of at least about 0.8 mg. per square inch of casing surface and has an exterior surface which is darker than the interior surface of the casing, (b) shirring said treated casing to provide a shirred tubular cellulosic food casing having an exterior surface which is darker than the interior surface, said shirred tubular cellulosic food casing being suitable, without other smoking procedures, for imparting smoke color and smoke flavor to food products encased and processed therein, and then (c) stuffing said treated casing with a food emulsion while said treated casing has said liquid smoke composition on the external surface thereof.

4,518,620

PROCESS FOR BREADING FOOD

Charles W. Monagle, and Janet C. Smith, both of Fort Wayne, Ind., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Aug. 26, 1983, Ser. No. 526,690

Int. Cl.³ A23L *1/176*

U.S. Cl. 426—291 **17 Claims**

1. A process for preparing breaded foods comprising applying a fat emulsion batter to a core comestible, thereafter breading the batter coated comestible, and thereafter overcoating the breaded comestible with an aqueous solution of egg white having at least about 5% egg white whereby food is oven bakeable while maintaining the characteristics of a fat fried food, said batter including from about 0.5% to about 15% based on the total weight of the emulsion of an emulsion stabilizer, and from about 30% to about 80% of a fat which is liquid at room temperature.

4,518,621

METHOD AND APPARATUS FOR FINISHING JUICES FROM FRUITS AND VEGETABLES AND THE LIKE

L. Bruce Alexander, San Marino, Calif., assignor to Brown International Corporation, Covina, Calif.

Filed Jun. 2, 1983, Ser. No. 500,553

Int. Cl.³ A23P *1/00*; B30B *9/26*; B01D *33/10*

U.S. Cl. 426—495 **27 Claims**

9. In a method for extracting fluid, finished to a relatively

high degree, from a slurry including substantial solids, the steps comprising:

mounting a cylindrical screen means for rotation in a housing,

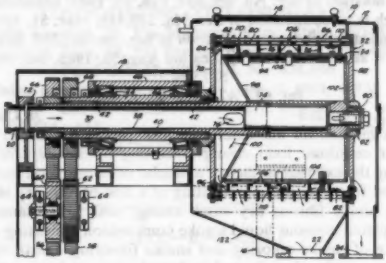
supplying slurry into one end of said cylindrical screen means,

rotating said screen means to exert centrifugal force on the slurry for urging the slurry fluid to pass through said screen means,

receiving slurry solids at the other end of said cylindrical screen means,

collecting finished fluid after it passes through said screen means,

providing a cylindrical support structure arranged coaxially within and adapted for rotation relative to said screen means, and



mounting upon said cylindrical support structure a plurality of paddle means each having wiper means formed thereon, said paddle means being secured upon said cylindrical support structure in helical alignment relative to the axis of said screen means while permitting radial movement of said paddle means in response to centrifugal force developed by rotation of said support means for maintaining said wiper means in generally continuous wiping engagement with said screen means along substantially its entire axial length whereby said paddle means serve to distribute the slurry generally uniformly on said screen means while simultaneously urging solids toward the other end of said cylindrical screen means and wiping clean said screen means to promote separation of slurry liquid from slurry solids and flow of the slurry liquid through said screen means.

12. The method of claim 9 being carried out for separating a finished juice from solid components of an initial juice.

4,518,622

DRY MIX FOR PREPARATION OF PIE AND PASTRY FILLINGS

Mildred N. Wilson, Wilton; Robert L. Danielson; Peter M. Bosco, both of Brookfield Center, all of Conn., and Wayne L. Steensen, Newark, Del., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 30, 1984, Ser. No. 595,263

Int. Cl.³ A23L *1/187, 1/195*

U.S. Cl. 426—578 **10 Claims**

1. A dry mix capable of being hydrated in an aqueous medium to form, without need for cooking, a firm gelled mass suitable for use as a pastry or pie filling and having textural and organoleptic properties similar to those possessed by a cooked, starch-based filling,

said mix comprising a substantially dry, particulate mixture of (a) a sugar component consisting essentially of sucrose; (b) a starch component; (c) a sufficient quantity of food-grade acidulant to achieve a pH in the range of from about 2.0 to about 5.0 in the hydrated filling; and (d) appropriate amounts of flavorants and/or colorants;

and wherein said mix does not contain a gelation system other than said starch component;

and wherein said starch component comprises a gellable starch in an amount sufficient to provide from about 3% to about 10% by weight thereof in said hydrated filling and sufficient to convert the admixture of said dry mix and an aqueous medium having a temperature in the range of from about 40° F. to about 70° F. to a firm gelled mass, without cooking, having the following properties measured at 50° F. and after thirty minutes, one hour and two hours, respectively: penetration depth of less than about 300 mm, less than about 260 mm and less than about 230 mm, and viscosity values of at least about 4,000 cp, at least about 26,000 cp and at least about 46,000 cp;

and wherein said gellable starch itself is a cold-water swellable starch which has the following properties as determined in independent tests using the standardized ingredient mixtures indicated: a pH of from about 4.0 to about 6.0; a percentage of cold-water solubles of at least about 70% by weight; and a thickening and gelation capacity capable of converting a 70° F. mixture of about 6% of said starch, about 70% water and about 24% of a sugar consisting of a high fructose corn syrup having 55% fructose and a solids content of about 77%, to a mass having a gel strength of at least about 90 grams within about fifteen (15) minutes.

4,518,623

POLYMERIC FILM COATING METHOD WITH CONTINUOUS DEPOSITION PRESSURE CONTROL

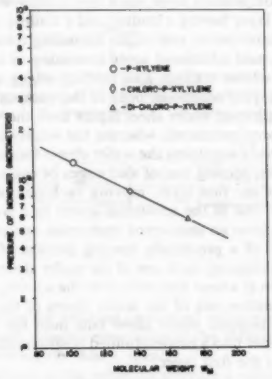
Thomas J. Riley, 905 Richmar Dr., Westlake, Ohio 44145

Division of Ser. No. 444,486, Nov. 24, 1982, Pat. No. 4,495,889.

This application Apr. 27, 1984, Ser. No. 604,968

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—8 **3 Claims**



2. In a method of coating substrates with polymer film based on p-xylylene which includes vaporizing di-p-xylylene dimer, pyrolizing the vaporized dimer to the monomeric diradicals, and depositing the film by vapor-phase polymerization of the monomer vapor, the improvement comprising the steps of continuously monitoring the pressure of the monomer vapor after pyrolization and continuously adjusting the vaporization rate of the p-xylylene into a dimer in response to the variations of actual pressure of the pyrolized monomer vapor from an optimum pressure to reduce variations between the measured and optimum pressure in order to produce a completed polymeric reaction in a minimum amount of time.

4,518,624

PROCESS OF MAKING A CORROSION-RESISTANT COATED FERROUS BODY

Dong-Sil Park, and Robert J. Zabala, both of Schenectady, N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 525,780, Aug. 24, 1983,. This application Mar. 26, 1984, Ser. No. 593,081

Int. Cl.[3] C23C *11/04, 7/00*

U.S. Cl. 427—34 7 Claims

1. A process for producing a corrosion resistant coated ferrous metal body which is polarization free or which is free of significant polarization, said coated body being useful as a component in a sodium sulfur cell wherein said coating is in contact with said sulfur, said process comprises providing a ferrous metal body, depositing a layer of molybdenum at least about 10 microns thick on the surface of said body, heating said molybdenum-layered body to a temperature ranging from about 800° C. to 1200° C., and diffusing chromium halide vapor through said molybdenum layer and into contact with the surface of said ferrous body producing a coating diffusion bonded to said ferrous metal body, the bulk of said coating consisting essentially of an alloy of at least about 70% by weight molybdenum, up to about 5% by weight iron balance of at least about 1% by weight chromium, the outside surface of said coating or outside surface portion extending from said bulk portion consisting essentially of an alloy ranging from about 30% by weight to about 80% by weight chromium, up to about 1% by weight iron balance molybdenum, said outside surface or outside surface portion being significantly richer in chromium than said bulk portion, said outside surface or outside surface portion containing sufficient chromium to make said coated body polarization free or free of any significant polarization, and a diffusion bonding layer comprised of MoCrFe alloy extending from said bulk portion into said metal body, said diffusion bonding layer consisting essentially of at least about 10% by weight molybdenum, at least about 5% by weight chromium and at least about 10% by weight iron.

4,518,625

ARC SPRAY FABRICATION OF METAL MATRIX COMPOSITE MONOTAPE

Leonard J. Westfall, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 9, 1983, Ser. No. 560,035

Int. Cl.[3] B05D *1/02;* C23C *7/00*

U.S. Cl. 427—37 10 Claims

1. A method of making a metal matrix composite monotape comprising the steps of

mounting an array of fibers on a support means in a chamber,

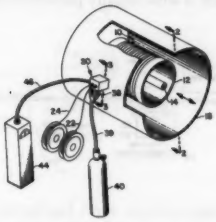
evacuating said chamber to remove gaseous contaminants therefrom,

filling said chamber with a neutral gas until the pressure within said chamber is above atmospheric,

inserting a pair of wires of the matrix metal into feed-through openings in a wall of said chamber and feeding said wires into said chamber until the extreme outermost ends thereof are in close proximity to said fiber array,

striking an arc between said outermost end portions thereby causing the same to melt, and

passing a high velocity stream of said neutral gas at a pressure between about 60 psi and about 120 psi through said arc into said chamber thereby forcing molten matrix metal from said arc in said stream to spray onto said array in said contaminant free atmosphere.



4,518,626

PROCESS FOR PREPARING MAGNETIC RECORDING MEDIUM

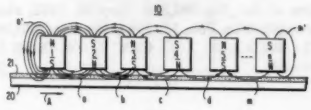
Mikihiko Kato; Shigeo Komine; Toshio Kawamata; Kazuhiko Morita, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1983, Ser. No. 566,455

Claims priority, application Japan, Dec. 29, 1982, 57-230910

Int. Cl.[3] H01F *10/02*

U.S. Cl. 427—48 5 Claims



1. A process for preparing a magnetic recording medium comprising a non-magnetic strip support base having coated thereon a magnetic coating layer, the process comprising the step of continuously travelling an undried magnetic layer on a support through a means for random magnetic orientation comprising at least five magnets which are installed at an interval from each other over the undried magnetic layer or under the support base, said magnets being positioned in such a manner that each adjacent pole of the magnets facing the magnetic layer or the reverse surface of the support base has a different polarity, that the strength of the magnetic field of each magnet is gradually reduced toward the travelling direction of the magnetic layer and that the direction of the line of the magnetic force between adjacent magnets is parallel to the magnetic layer and in opposite directions, whereby ferromagnetic fine particles in the magnetic layer are randomly oriented.

4,518,627

APPARATUS AND METHOD FOR DISORIENTING MAGNETIC PARTICLES IN MAGNETIC RECORDING MEDIA

James Foley, Wellesley; Fawwaz Habbal, Cambridge, and John Leahy, Burlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 4, 1984, Ser. No. 646,770

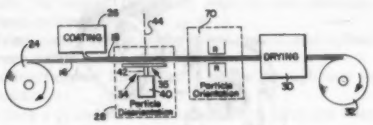
Int. Cl.[3] H01F *10/02*

U.S. Cl. 427—48 28 Claims

1. Apparatus for magnetically disorienting magnetic particles in a fluid magnetic layer carried on a non-magnetic sup-

port which is being moved so that the magnetic layer advances in a plane, said apparatus comprising:

means for defining a magnetic field that projects into the plane of the magnetic layer and is disposed about an axis of rotation which is substantially perpendicular to the plane; and



means for effecting rotation of said magnetic field about said axis so that said rotating field interacts magnetically with the particles to cause disorientation of the particles in the magnetic layer.

4,518,628

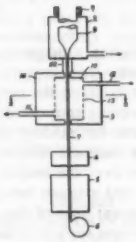
HERMETIC COATING BY HETEROGENEOUS NUCLEATION THERMOCHEMICAL DEPOSITION

Dipak R. Biswas, and Dilip K. Nath, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 382,856, May 28, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 580,280

Int. Cl.³ B05D *3/06, 5/06;* **C23C** *13/08;* **D04B** *5/00*

U.S. Cl. 427—55 **23 Claims**



1. A method of applying a hermetic coating to an exposed surface of an optical fiber, comprising the steps of

passing the fiber through a gaseous medium containing at least one reactant capable of undergoing a chemical conversion into the material of the coating when heated to a predetermined temperature; and

directing infrared radiation from all radial directions against the optical fiber to heat the same at least at its exposed surface at least to the predetermined temperature for the chemical conversion into and simultaneous deposition of the material of the coating to take place directly on the exposed surface, including omnidirectionally issuing the infrared radiation, and reflecting at least a part of the issued infrared radiation which would otherwise not reach the optical fiber onto the exposed surface of the optical fiber for such reflected infrared radiation to reach the exposed surface from radial directions angularly spaced from the direction of direct travel of the infrared radiation.

4,518,629

PROCESS FOR POSITIONING AN ELECTRICAL CONTACT HOLE BETWEEN TWO INTERCONNECTION LINES OF AN INTEGRATED CIRCUIT

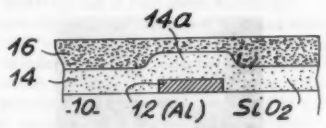
Pierre Jeuch, Seyssins, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,441

Claims priority, application France, Dec. 10, 1982, 82 20721

Int. Cl.³ H01L *21/88*

U.S. Cl. 427—89 **5 Claims**



1. A process for positioning an electrical contact hole between a first interconnection line and a second interconnection line of an integrated circuit, comprising the steps of: forming the first interconnection line of the integrated circuit, and thereafter in successive stages:

(a) depositing an insulating coating on the integrated circuit;

(b) depositing on said insulating coating, a first coating of a material used for blanking or erasing a relief of the insulating coating and having a planar surface;

(c) etching the first material coating, in order to bare the relief area of the insulating coating located above the first interconnection line;

(d) defining the dimensions of the electrical contact hole to be formed by masking with the aid of a resin;

(e) etching the insulating coating in order to form the electrical contact hole;

(f) removing the mask and eliminating residual portions of the first material coating;

(g) forming the second interconnection line in successive stages:

(h) depositing a conductive coating in which the second interconnection line will be formed on the integrated circuit;

(i) depositing on said conductive coating, a second coating of material for erasing or blanking the relief of the conductive coating and having a planar surface;

(j) etching the second material coating in order to only leave material at the location of the electrical contact hole;

(k) depositing a resin coating on the integrated circuit, so as to mask the second interconnection line to be formed;

(l) etching the region of the conductive coating without resin or residual portions of the second material coating; and

(m) eliminating the residual second material coating and the resin coating.

4,518,630

METHOD FOR FORMING SILICON OXIDE FILMS

Leo Grasser, Munich, Fed. Rep. of Germany, assignor to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,530

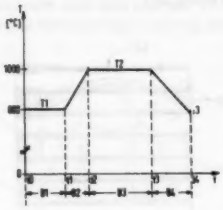
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206376

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—93 **7 Claims**

1. Method for forming silicon oxide layers on silicon surfaces which comprises subjecting the silicon surface to at least two oxidation steps; (a) a first oxidation step carried out at a low oxidation temperature in the range of 700° C. to 900° C. in an atmosphere containing a mixture of oxygen and hydrochloric acid with a low hydrochloric acid concentration, (b) a second oxidation step carried out at a higher oxidation temperature of at least 100° C. above the low oxidation temperature of the first step and within the temperature range of 850° C. to 1050° C.,

and in a dry oxygen atmosphere, (c) an intermediate step between step (a) and step (b) wherein the oxidation temperature is increased from the low oxidation temperature of step (a) to the high oxidation temperature of step (b), in an atmosphere



containing a mixture of oxygen and hydrochloric acid with a low hydrochloric acid concentration, and (d) immediately after the second oxidation step (b) carrying out a cooling-down step to cool down the silicon oxide on the silicon surface.

4,518,631

THIXOTROPIC CURABLE COATING COMPOSITIONS

Robert C. Antonen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 14, 1983, Ser. No. 551,232
Int. Cl.³ C08L *63/04, 63/02*
U.S. Cl. 427—96 **26 Claims**

1. A curable liquid coating composition comprising a homogeneous mixture of

(A) a polyfunctional liquid or solubilized epoxide reactant selected from the group consisting of cycloaliphatic epoxide compounds, glycidyl ethers of polyhydric phenols, epoxidized novolak resins and mixtures thereof;

(B) a polyfunctional liquid or solubilized organosilicon reactant selected from the group consisting of silanes and polyorganosiloxanes, wherein each molecule of said organosilicon reactant contains at least two silicon-bonded groups selected from the group consisting of hydroxyl and alkoxy containing from 1 to 4 carbon atoms;

(C) an amount of filler sufficient to impart a viscosity of from 50 to 1000 Pa·s, measured at 25° C., to said composition; and

(D) a curing catalyst in an amount sufficient to promote curing of said composition;

wherein the degree of thixotropic character exhibited by said composition is a function of the weight ratio of said epoxide reactant to said organosilicon reactant, and exhibits a gradual variation from a maximum degree of thixotropic character at weight ratio value r_1 to a minimum degree of thixotropic character at weight ratio value r_2, the values represented by r_1 and r_2 being within the range of from 1:1 to 8:1, inclusive.

4,518,632

METALLIZED SYNTHETIC CABLE

Thomas E. Jones, Spring Valley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1984, Ser. No. 601,751
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—118 **10 Claims**

1. A method of fabricating an essentially neutrally buoyant undersea data communications link having a low resistance for transmitting in a frequency range having a 100 kHz upper limit comprising:

providing a bundle of at least one hundred continuous synthetic fibers each having a diameter of between eight and ten microns, weight of between 1.75 and 2.02 gm/cm³ and a tensile strength in the range of 200,000–400,000 lbs/in² (1.4–2.8 GPa);

coating each continuous synthetic fiber with a metallized layer to a one to three micron thickness, the metallized layer having a DC resistance of approximately one ohm per foot for a 100 fiber bundle; and

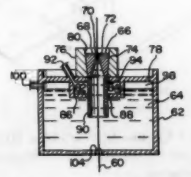
covering the metallized layer coated continuous synthetic fiber bundle with a dielectric insulation.

4,518,633

PRODUCTION OF INSULATED ELECTRICAL CONDUCTORS

Jorg-Hein Walling, Beaconsfield; Michael A. Shannon, Glenburnie, and Gerald Arbuthnot, Chateauguay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1984, Ser. No. 597,381
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—120 **18 Claims**



1. A method of providing an insulated electrical conductor by passing the conductor upwardly through a coating fluid and then upwardly through a die means, which is held in a vertical position relative to the fluid by a supporting fluid force which holds the die means horizontally spaced from a surrounding annular die support means while upwardly supporting the die means, with the support means causing or influencing the fluid force, thus allowing the die means freedom to move horizontally, the die means controlling the thickness of a surrounding layer of the fluid upon the conductor, the viscosity of the fluid being insufficient to raise the die means away from the fluid as the fluid coated conductor passes through the die, and concentricity of the fluid coated onto the conductor being ensured during any lateral movement of the conductor, by corresponding horizontal movement of the die means caused by hydrodynamic forces existing between the conductor and die surfaces.

9. Apparatus for insulating an electrical conductor including a container for holding a quantity of a coating fluid, die means having a die orifice and an annular die support means which surrounds the die means radially of the die orifice, the die support means provided to cause or influence a supporting fluid force to support the die means vertically upwards while holding the die means horizontally spaced from and within the support means.

17. A method of providing an insulated electrical conductor by passing the conductor upwardly through a coating fluid and then upwardly through a die means, the fluid comprising a fluid carrier in admixture with magnetically permeable particles, disposing the die means withi the carrier with the die means having freedom to move horizontally and including a magnet with its poles disposed in the direction of fluid flow through the die orifice, and levitating the magnet to a position

within the mixture dictated by the strength of the magnetic flux of the magnet.

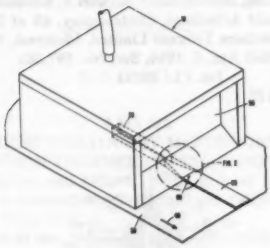
18. Apparatus for insulating an electrical conductor including a container for holding a quantity of a coating fluid comprising a mixture of a fluid carrier and magnetically permeable particles, and die means having a die orifice and a magnet with poles relatively disposed in the direction of fluid flow through the die orifice, the magnet when immersed within the mixture being levitated by the strength of the magnetic flux and the quantity and permeability of the particles to locate the die means in a specific position within the container.

4,518,634

METHOD AND APPARATUS FOR COATING MAGNETIC RECORDING MEDIA

Donald Gini, Boulder, and Dean B. Stockton, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1983, Ser. No. 493,838
Int. Cl.³ H01F *10/02*
U.S. Cl. 427—128 **11 Claims**



1. A coating head for use in coating a stripe of thixotropic liquid onto a substrate by relative movement between the head and the substrate, comprising:

a container for holding a quantity of said liquid, said container having an opening defining a liquid-shear station whose shear force on said liquid is activated by said relative movement; and

a confined, four-wall, expanding-volume coating orifice defined by a movement-trailing wall of said container, said orifice being aligned with said opening to receive reduced-viscosity liquid from said shear station as a result of said relative movement;

one wall of said orifice being the substrate, and the remaining three walls of said orifice being defined by a notch which is formed in said trailing wall, said notch having a top wall opposite the substrate, and two side walls which join the top wall to the substrate, said top and side walls extending in a manner to cause the volume of said coating orifice to expand in the direction of said relative movement, thereby causing the viscosity of the liquid to increase in said direction while the liquid remains confined within said orifice.

4,518,635

PROCESS FOR SEALING AT LEAST ONE END OF A CELLULAR MODULE

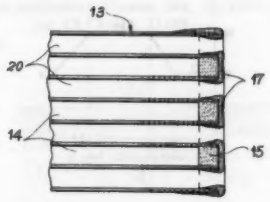
Guy Schnedecker, Paris, and Jacques Mougin, Wissous, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 17, 1983, Ser. No. 505,427
Claims priority, application France, Jun. 25, 1982, 82 11221
Int. Cl.³ B05D *7/22*
U.S. Cl. 427—232 **12 Claims**

1. A process for the selective sealing of at least one end of a cellular module having rows of parallel channels serving to carry at least two different fluids, at least a number of the channels being to be sealed while the other channels are to be left open, said process comprising the following steps:

depositing a preblocking material on said end of said cellular module, clogging all the channels,

removing the preblocking material from the channels which are to be left open, and



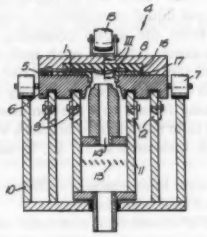
depositing a sealing material on said end of said cellular module, the preblocking material serving as a mechanical support for the sealing material during deposition of the latter to enable sealing of a channel, whereby only those channels having the preblocking material are sealed.

4,518,636

SELECTIVE PLATING

Michael A. Richards, Delapre, England, assignor to S. G. Owen Limited, Northampton, England

Filed Oct. 3, 1983, Ser. No. 538,657
Claims priority, application United Kingdom, Oct. 5, 1982, 8228378
Int. Cl.³ C25D *5/02*
U.S. Cl. 427—282 **9 Claims**



9. A method of selective plating a component, which method comprises contacting upper and lower faces of the component with upper and lower masks, respectively, said lower mask having a plating aperture to expose a part of the component to be plated, positioning the part of the component exposed by the plating aperture over a plating tank, and selective plating the exposed part of the component, the plating pressure and the hardness of the material comprising the upper mask being such that the upper mask is deformed at the plating aperture during plating so as at least partially to mask an edge of the said exposed part.

4,518,637

COATING SOLUTION METERING METHOD AND APPARATUS

Hideo Takeda, and Tsunehiko Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 19, 1983, Ser. No. 495,928
Claims priority, application Japan, May 19, 1982, 57-83237
Int. Cl.³ B05D *3/00*
U.S. Cl. 427—359 **5 Claims**

1. A method of metering a coating solution wherein a coil bar is rotatably supported on a holder comprising the steps of:

continuously supplying a solution substantially the same as said coating solution to both sides of the coil bar at parallel positions upstream and downstream in the direction of running of the web, at a predetermined flow rate, applying said solution to said coil bar to wet said coil bar and, removing surplus solution by scraping said web with said coil bar.

2. An apparatus for metering a coating solution coated on a

continuously running web comprising, a coil bar and a holder for rotatably supporting said coil bar, said holder having two solution-supplying slots with upper ends opening in parallel at both sides of the coil bar at positions upstream and downstream in the direction of running of the web, wherein slots are adapted to apply a solution which is substantially the same in composition as the coating solution is supplied from said source at a predetermined flow rate during metering.

4,518,638

METHOD FOR THE PROTECTION OF SHIPS AND OTHER OBJECTS AGAINST FOULING

Oystein Rasmussen, Hoslevelen 119, NO-1340 Beekestua, Norway

Filed Jan. 20, 1984, Ser. No. 572,527
Claims priority, application Norway, Jan. 31, 1983, 830306
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—407.1 **5 Claims**

4. A method for treating the underwater surface of ships and other structures as a protection against fouling, comprising:

mixing together a solution in non-polar solvents of a contact-leaching anti-fouling composition and a solution in a polar solvent of a composition containing both anionic and cationic hydrophilic polymers so as to disperse the hydrophilic polymers in the non-polar solution, and

immediately after making such mixture, applying the mixture on the surface to be protected.

5. The method according to claim 4, in which the applying step includes applying the mixture on top of a recently applied coat of a primer or an anti-fouling paint which still contains a residual amount of non-polar solvents.

4,518,639

GAME CUP WITH GAME INFORMATION UNDER THE ROLLED LIP

Stephen J. Phillips, Don Mills, Canada, assignor to Coca-Cola Limited, Toronto, Canada

Filed Mar. 26, 1984, Ser. No. 593,466
Int. Cl.³ B32B *7/06*
U.S. Cl. 428—35 **19 Claims**

1. A beverage cup comprising:

(a) a sidewall having a rolled lip,

(b) said rolled lip having a game information area at a particular location thereof and including game information located in said area and being hidden by said rolled lip;

(c) said sidewall including a snap-out section located below said area,

(d) said snap-out section being partly defined by snap-out means for allowing said section to be partly broken loose from said sidewall while leaving a side of said section still connected to said sidewall; and

(e) said section, when partly broken loose from said sidewall, being adapted to be moved around said rolled lip in said

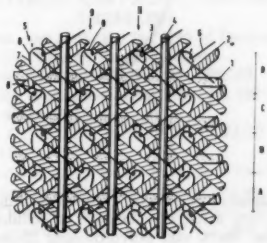
area to unroll said rolled lip in said area to reveal any game information in said area.

4,518,640

WARP KNITTED WARE WITH REINFORCING THREADS

Christian Wilkens, Heusenstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,355
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304345
Int. Cl.³ B32B *3/06*
U.S. Cl. 428—102 **17 Claims**



1. A fabric enmeshed by stitched ground ware, comprising:

a plurality of wales of warp thread stitched by rows;

a plurality of parallel, inlaid weft threads, each laid-in across said wales and between two adjacent rows of stitch loops in said warp thread, said rows of stitch loops being transverse to said warp thread; and

a first and second plurality of diagonally inlaid threads, said first plurality crossing said second plurality, each of the inlaid threads of said first and second plurality running alternatively and repetitively: (a) between two stitch loops of a corresponding adjacent pair of said wales and (b) between two stitch loops of two successive rows of stitch loops of said warp threads.

4,518,641

NON-SLIP SURFACE COATINGS

Bryan F. Shimmin, Feniscowles, and James B. Pollard, Worsley, both of England, assignors to Reed International P.L.C., London, England

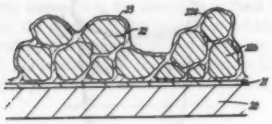
Filed Feb. 16, 1983, Ser. No. 466,775
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—150 **6 Claims**

1. A process for making a product having a non-slip surface comprising the steps of:

(a) taking a non-slip particulate material in the form of particles of rounded shape and wetting and mixing it with a

binder to create a flowable composition which is hardenable with time when applied as a film; and

(b) spraying the composition with a progressive cavity pump on to a base so that the particles of the non-slip materials



are caused to engage both with the base and with contiguous particles through the medium of a skin which hardens with time and which, on the surface of the product, closely follows the outline of the surface exposed particles of the non-slip material.

4,518,642

LOUDSPEAKER DIAPHRAGM AND METHOD FOR MAKING SAME

George C. Johnston, Clinton, N.C., and Michael A. Swieboda, Hickory Hills, Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.

Filed Apr. 15, 1983, Ser. No. 483,308

Int. Cl.³ D04H *1/04*

U.S. Cl. 428—172 **12 Claims**

1. A loudspeaker diaphragm comprising a diaphragm element comprising a felt of a mixture of cellulose fibers and polypropylene fibers, said polypropylene fibers being fused together to form a matrix of polypropylene which extends through the felt to stiffen the diaphragm element, the ratio of dry weight of the polypropylene fibers to dry weight of the cellulose fibers being in the range of about 0.1 to about 0.5.

4,518,643

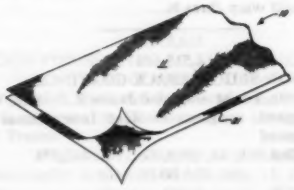
PLASTIC FILM

Michael A. Francis, Mechanicsville, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 25, 1983, Ser. No. 516,657

Int. Cl.³ B32B *1/00, 3/30*

U.S. Cl. 428—131 **9 Claims**



1. A thermoplastic film having a plurality of permanently embossed protuberances and depressions of predetermined geometric shapes constructed therein for controlling the coefficient of friction of sheets of the film when placed adjacent each other, each of said protuberances having a relatively flat portion therebetween and the width of each protuberance at its base being less than the length of the relatively flat portion of the film between the base of each protuberance, said protuberances being truncated geometric shapes arranged in latitudinally and longitudinally alternating rows, said film having a relatively rough or male side and a relatively smooth or female side whereby when a male surface of film is placed adjacent another male surface of the same film or a male surface of a separate sheet of film, the protuberances on said male surface of film mesh with the relatively flat portions of said another male surface of the same film or said male surface of the separate sheet of film and thereby a relatively high coefficient of friction is obtained and when a female surface of film is placed adjacent another female surface of the same film or a separate sheet of film, a relatively low coefficient of friction is obtained.

4,518,644

PAPER MACHINE SCREEN

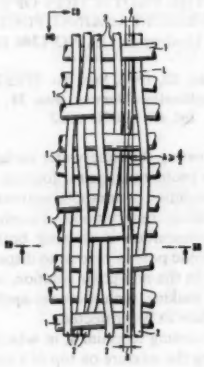
Tauno A. Vuorio, Zurich, Switzerland, assignor to Siebtuchfabrik AG, Olten, Switzerland

Filed Dec. 14, 1978, Ser. No. 969,359

Claims priority, application Switzerland, Dec. 15, 1977, 015417

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **19 Claims**



12. A single-ply multiple shaft Atlas weave paper making machine screen, comprising:

(a) a plurality of longitudinal threads having a direction of course generally oriented with the machine direction and a plurality of cross threads having a direction of course essentially transverse thereto;

(b) said longitudinal and cross threads being selectively interwoven and forming interlacing points and thereby providing said screen;

(c) a first one of said longitudinal and cross threads is bound to an adjacent one of said longitudinal and cross threads at a first one of said interlacing points and thereby laterally shifts said first one thread from said direction of course;

(d) said first one thread is bound to another adjacent one of said longitudinal and cross threads at a second one of said interlacing points for thereby laterally shifting said first one thread to said direction of course;

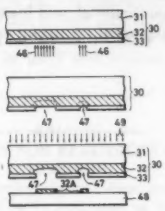
(e) said first one thread is shifted at said interlacing points a distance exceeding ½ the diameter of said first one thread; and,

(f) said cross threads have a diameter greater than said longitudinal thread diameter.

4,518,645
TRANSFER TYPE HEAT SENSITIVE RECORDING MEDIUM

Haruhiko Moriguchi, and Toshiharu Inui, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,795
Claims priority, application Japan, Sep. 13, 1982, 57-158203
Int. Cl.[3] B41M *5/26*
U.S. Cl. 428—212 2 Claims

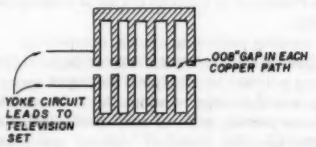


1. A transfer type heat sensitive recording medium comprising a base sheet, an ink layer on one surface of said base sheet of a colored ink which is adapted to be fluidized or sublimated at a predetermined temperature higher than room temperature, and a coating layer on said ink layer of a coating material which is adapted to be dissolved into said ink layer or sublimated when heated at a temperature higher than said predetermined temperature.

4,518,646
PRINTED CIRCUIT BOARD LAMINATE WITH ARC-RESISTANCE

Roy F. Nichols, Jr., Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 177,980, Aug. 14, 1980, , which is a continuation-in-part of Ser. No. 148,607, May 12, 1980, abandoned. This application Dec. 1, 1983, Ser. No. 557,016
Int. Cl.[3] H05K *1/00*
U.S. Cl. 428—248 5 Claims

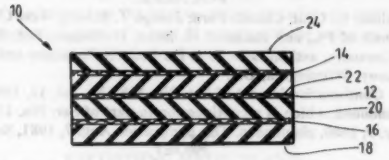


4. A high voltage arc-resistant laminate for printed circuit boards of the type having a substrate and metallic foil bonded on one or both surfaces of said substrate, said substrate including core sheets of cellulosic paper impregnated with a resin formulated from a composition including a major amount of a phenolic or epoxy resin, and a face sheet adjacent said metallic foil, said face sheet comprising glass fiber cloth impregnated with a resin formulated from a composition containing about 60 to 85 percent by weight brominated aromatic epoxy resin solids polymerized with minor amounts of a curing agent and an amine catalyst, said curing agent and catalyst each containing no aromatic groups and no heterocyclic rings containing conjugated double bonds, together with minor amounts of antimony oxide and fumed silicon dioxide.

4,518,647
AGRICULTURAL BELTING MATERIAL

Donald Morrison, Anthony, Kans., assignor to Morrison Company, Inc., Anthony, Kans.

Filed Jun. 11, 1984, Ser. No. 619,023
Int. Cl.[3] B32B *7/00*
U.S. Cl. 428—250 9 Claims



1. A multiple ply material for use in belting, comprising:
a center fabric ply formed of a first synthetic fabric;
first and second fabric plies disposed on opposite sides of said center fabric ply, said first and second outer fabric plies including strands in the warp direction which have an elongation modulus and a flex fatigue life which are greater than those of said center fabric ply, said first and second fabric plies having extruded monofilament yarns in the fill direction; and
a plurality of rubber layers, said rubber layers disposed on opposite sides of said first and second outer fabric plies.

4,518,648
SHEET MATERIAL AND PRODUCTION METHOD THEREOF

Hiroyasu Miyata, and Kazuhiko Ito, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 9, 1984, Ser. No. 588,143
Claims priority, application Japan, Mar. 10, 1983, 58-38176; Mar. 10, 1983, 58-33469[U]
Int. Cl.[3] B32B *3/10, 5/20;* H01R *13/48*
U.S. Cl. 428—256 9 Claims

1. A sheet material comprising a net-shaped member having projecting portions and recessed portions, and an electrically insulating layer in which the net-shaped member is buried such that only the projecting and recessed portions thereof are exposed out of the insulating layer.

2. A method for producing a sheet material comprising the steps of preparing a paste of a high-molecular substance mixed with microcapsules thermally expansible at a low temperature, forming the paste into an insulating layer, burying a net-shaped member made of an electrically conductive material and having projecting portions and recessed portions into the insulating layer such that the entire meshes of the net-shaped member are filled with the paste, removing excess high molecular weight substance to expose the projecting and recessed portions of the net-shaped member from the surface of the insulating layer, heating the entire combination to a temperature adapted to expand the microcapsules contained in the paste, and hardening the paste for obtaining the ultimate product.

4,518,649
SOIL RELEASING TEXTILES CONTAINING FLUOROCHEMICAL SOIL RELEASE AGENTS AND METHOD FOR PRODUCING SAME

Robert C. Wang, Monmouth Junction; Arthur J. Sampson, Belle Mead, and Mark M. Persinko, Bridgewater, all of N.J., assignors to Chicopee, New Brunswick, N.J.

Filed May 11, 1984, Ser. No. 609,259
Int. Cl.[3] B32B *27/00*
U.S. Cl. 428—284 13 Claims

1. A fabric comprising at least 10% by weight of polyester fibers, said fabric being durably soil releasing on laundering, said fabric being finished with a soil release finish consisting

essentially of a cured mixture of (A) a fluorochemical soil release agent; (B) an adhesive binder; and (C) a cross-linking agent.

4,518,650

PROTECTIVE CLOTHING OF FABRIC CONTAINING A LAYER OF HIGHLY FLUORINATED ION EXCHANGE POLYMER

Walther G. Grot, Chadds Ford; Joseph T. Rivers, West Chester, both of Pa., and Raimund H. Silva, Hattingen, Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 168,638, Jul. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,681, Apr. 9, 1980, abandoned. This application Aug. 7, 1981, Ser. No. 290,867

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.[3] **B32B** *27/08, 27/00*

U.S. Cl. 428—286 **21 Claims**

1. Use in clothing to protect the wearer against hazardous substance of a composite fabric, said fabric containing as the essential component thereof a continuous film of a highly fluorinated ion exchange polymer having sulfonic acid functional groups, there being at least one fluorine atom attached to each carbon atom to which each said functional group is attached, said polymer having an equivalent weight no greater than about 2000, all the components of said composite fabric being hydrophilic.

4,518,651

MICROWAVE ABSORBER

William R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1983, Ser. No. 466,939

Int. Cl.[3] **B65B** *25/22;* **B65D** *81/34*

U.S. Cl. 428—308.8 **8 Claims**

1. A composite material for generation of heat by absorption of microwve energy comprising:

(a) a porous, dielectric, substrate substantially transparent to microwave radiation;

(b) an electrically conductive coating on one surface of the substrate comprising;

(i) electrically conductive particles in

(ii) a thermoplastic dielectric matrix, wherein, at least some of the matrix is beneath the surface of the substrate, is substantially free of electrically conductive particles, and is intermingled with the substrate; and

(c) a protective layer of polyethylene terephthalate adhered to the electrically conductive coating.

3. A process for manufacturing a composite material generation of heat by absorption of microwave energy comprising:

(a) providing a porous, dielectric, substrate substantially transparent to microwave radiation;

(b) applying to the substrate a coating of a dispersion of finely-divided, electrically conductive, particles in a thermoplastic dielectric matrix;

(c) heating the coating and the substrate to a temperature above the softening point of the matrix; and

(d) pressing the heated coating against the substrate at a pressure of 600 to 8700 kilopascals for 0.03 to 200 seconds.

4,518,652

METHOD FOR FORMING A LIGHTWEIGHT CEMENTITIOUS STRUCTURAL PRODUCT AND PRODUCT FORMED THEREBY

Michael D. Willoughby, Palatine, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 15, 1983, Ser. No. 514,349

Int. Cl.[3] **B32B** *5/18*

U.S. Cl. 428—312.4 **16 Claims**

1. A method for the production of a lightweight structural member, which comprises preparing a settable aqueous slurry of a cementitious material, mixing an aqueous foam into said slurry, forming said slurry into the proper shape for said structural member, and setting and drying said cementitious material, said foam being prepared by passing water and a foaming agent consisting essentially of polyvinyl alcohol through a foaming apparatus.

9. A lightweight structural member produced by preparing a settable aqueous slurry of a cementitious material, mixing an aqueous foam into said slurry, forming said slurry into the proper shape for said structural member, and setting and drying said cementitious material, said foam being prepared from water and a foaming agent consisting essentially of polyvinyl alcohol.

4,518,653

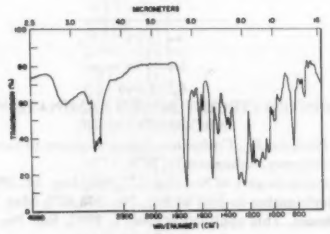
CHEMICALLY TREATED GLASS FIBERS FOR REINFORCING POLYMERIC MATERIALS AND PROCESSES

Donald E. McWilliams, Pittsburgh; Carl A. Melle, Gibsonia, and Balbhadra Das, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1983, Ser. No. 564,669

Int. Cl.[3] **D02G** *3/00*

U.S. Cl. 428—378 **20 Claims**



1. Glass fiber strands having a plurality of glass fibers where each glass fiber has at least a portion of its surface covered with the dried residue of an aqueous chemical treating composition, comprising:

a. a film forming polymeric system, comprising:

1. an aqueous soluble, emulsifiable or dispersible epoxy-containing polymer or copolymer having an epoxy equivalent weight in the range of about 180 to about 230 grams of polymer per one gram of equivalent epoxide and present in the aqueous chemical treating composition in an amount of about 50 to about 70 weight percent of the solids of the aqueous chemical treating composition.

2. an aqueous soluble, emulsifiable or dispersible non-tacky film forming polymer which is compatible in the epoxy-containing polymer,

3. polyvinyl pyrrolidone in an amount of not greater than 25 weight percent of the solids of the aqueous chemical treating composition,

b. methacryloxy alkyltrialkoxy silane coupling agent,

c. cationic glass fiber lubricant in an effective lubricating amount,

d. water in an amount to give a total solids in the range of about 1 to about 30 weight percent, wherein the aqueous chemical treating composition is essentially free of glass fiber lubricants which are water insoluble, hydrogenated or saturated fatty acid esters of glycerol or vegetable oils.

4,518,654

ONE-SIDED CLING STRETCH WRAP

George N. Eichbauer, Fairport, and Beth A. LeBlanc, Rochester, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1983, Ser. No. 564,664
Int. Cl.[3] B32B *27/06, 27/32*
U.S. Cl. 428—331 10 Claims

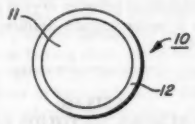
1. A stretch wrap film having one-sided cling comprising a transparent thermoplastic A/B film structure wherein layer A, in its stretched condition, has a comparatively high cling force to layer B and layer B has at least substantially no cling force to a layer of itself and has a slide property when layer B is in contact with a layer of itself with relative motion therebetween.

4,518,655

FUSING MEMBER FOR ELECTROSTATOGRAPHIC COPIERS

Arnold W. Henry, Pittsford; Jack C. Azar, and John Sagal, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1983, Ser. No. 555,103
Int. Cl.[3] B21B *31/08;* B32B *5/16*
U.S. Cl. 428—329 8 Claims



1. A thermally conductive fuser member for use in an electrostatographic reproducing machine comprising a rigid base, a thin deformable layer of a composition coated thereon, said composition comprising the crosslinked product of a mixture of about 100 parts by weight of alpha omega-hydroxypolydimethylsiloxane having a number average molecular weight between about 5,000 to about 20,000, about 190 to 250 parts by weight of alumina, said alumina comprising from about 60 to about 90 percent by weight of finely divided tabular alumina having a particle size less than about 100 mesh in size and from about 10 to about 40 percent by weight of finely divided calcined alumina having a particle size less than about 1 micrometer, a crosslinking agent and a crosslinking catalyst, said crosslinking agent and catalyst being present in amounts sufficient to promote crosslinking of said siloxane.

4,518,656

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Tsutomu Okita, and Kyoichi Naruo, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 345,829, Feb. 4, 1982,. This application Oct. 3, 1983, Ser. No. 537,552
Claims priority, application Japan, Feb. 4, 1981, 56-15393
Int. Cl.[3] H01F *10/02*
U.S. Cl. 428—403 7 Claims

1. A process for producing a magnetic recording medium which comprises the steps of applying onto a non-magnetic base a composition comprising (1) a compound having an unsaturated bond polymerizable by electron beams, (2) at least one polymer, (3) ferromagnetic particles, and (4) an organic solvent, and curing the resulting magnetic layer by irradiation with electron beams, said polymer being selected from the group consisting of nitrocellulose and a polymer containing 0.01 to 10 wt % of $-CO_2H$ group and, being such that at least 10% thereof is adsorbed on the ferromagnetic particles in a mixture of 10 parts by weight of a 1 wt % solution of the polymer and 1 part by weight of the ferromagnetic particles.

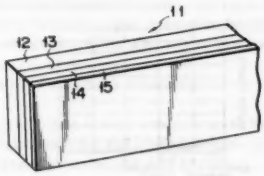
6. A magnetic recording medium prepared by the steps of applying onto a non-magnetic base a composition comprising (1) a compound having an unsaturated bond polymerizable by electron beams, (2) at least one polymer, (3) ferromagnetic particles, and (4) an organic solvent, and then polymerizing and curing the resulting magnetic layer by irradiation with electron beams, and polymer being selected from the group consisting of nitrocellulose and a polymer containing 0.1 to 10 wt % of $-CO_2H$ group and, being such that at least 10% thereof is adsorbed on the ferromagnetic particles in a mixture of 10 parts by weight of a 1 wt % solution of the polymer and 1 part by weight of the ferromagnetic particles.

4,518,657

RECORDING MEDIUM AND RECORDING-REPRODUCTION SYSTEM PROVIDED WITH THE RECORDING MEDIUM

Tuneo Yanagida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,829
Claims priority, application Japan, Oct. 17, 1980, 55-145117
Int. Cl.[3] G11B *5/72, 5/66*
U.S. Cl. 428—450 10 Claims



1. A recording and reproduction system which comprises: a recording head constituted by main and auxiliary magnetic poles so arranged as to clamp a recording medium which is formed of a first layer comprising a first magnetic alloy material having perpendicular magnetic anisotropy, a high coersive force, a high remnant magnetic flux density and a small anisotropy dispersion angle, a second layer comprising a second magnetic amorphous alloy of a rare earth metal—3d transition metal positioned on said first layer, said second layer having a lower coersive force and higher Curie temperature than said first layer, said first and second alloys being different alloys and one of them containing one constituent element not present in said other alloy; and a protective layer prepared from a transparent nonmagnetic material on said second magnetic layer for recording data on the recording medium by a perpendicular magnetic recording method; and

reproduction means for reading data out of the recording medium by the magneto-optics effect.

4. A recording medium comprising a first and a second contiguous magnetic alloy layers:

said first magnetic alloy layer comprising a first magnetic alloy material having perpendicular magnetic anisotropy, a high coercive force, a high remnant magnetic flux density and a small anisotropy dispersion angle;

said second magnetic layer comprising a second magnetic amorphous alloy of a rare earth metal—3d transition metal positioned on said first magnetic layer, said second magnetic layer having a lower coercive force and higher Curie temperature than said first magnetic layer, said first and second alloys being different alloys and one of them containing one constituent element not present in said other alloy; and

a protective layer prepared from a transparent nonmagnetic material on said second magnetic layer.

4,518,658

WATERPROOF MEMBRANE WITH FUSE BONDED NON-WOVEN REINFORCEMENT

Jean Baravian, Croissy sur Seine, and Jacques Barbey, Beynost Miribel, both of France, assignors to Rhone-Poulenc Fibres, Lyon, France

Filed May 21, 1984, Ser. No. 612,344
Claims priority, application France, May 25, 1983, 83 08769
Int. Cl.³ B32B *11/02*
U.S. Cl. 428—291 **8 Claims**

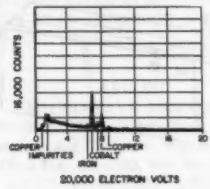
1. A waterproof membrane consisting of a bitumen-coated reinforcement. characterized in that the reinforcement is a nonwoven of heat-bonded continuous filaments containing:
from 70 to 90% of polyethylene glycol terephthalate and
from 30 to 10% of polybutylene glycol terephthalate.

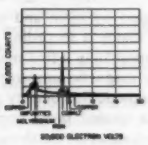
4,518,659

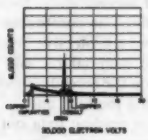
SWEEP THROUGH PROCESS FOR MAKING POLYCRYSTALLINE COMPACTS

Paul D. Gigl, and Hyun S. Cho, both of Worthington, Ohio, assignors to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 364,714, Apr. 2, 1982,. This application Sep. 23, 1983, Ser. No. 536,221
Int. Cl.³ B24D *3/10;* **C01B** *21/64;* **B01J** *3/06*
U.S. Cl. 428—539.5 **31 Claims**







1. An improved process for making a polycrystalline diamond compact comprising subjecting a mass of diamond particles, which mass is in contact with a source of catalyst for diamond recrysallization, to a high pressure/high temperature process which results in a compact characterized by diamond-to-diamond bonding and containing an interstitial metal phase comprising catalyst; wherein the improvement comprises placing in contact with the mass of diamond particles an additional metal or metal alloy selected from the group consisting of:
(a) single metals and non-catalytic alloys of such metal which: (i) have a lower melting point than the catalyst; (ii) do not interfere with the function of the catalyst; and (iii) are miscible with the catalyst; and
(b) single metals and non-catalytic alloys of metals as described in (a) above in the form of catalytic alloys with the catalyst, which catalytic alloys do not interfere with the function of the catalyst and at least initially form a catalyst-lean liquid phase during the high pressure/high temperature process.

15. An improved process for making a polycrystalline cubic boron nitride compact comprising subjecting a mass of cubic boron nitride particles, which mass is in contact with a source of sintering catalyst, to a high pressure/high temperature process which results in a compact having at least 70 volume percent cubic boron nitride content and an interstitial metal phase comprising catalyst within the resulting polycrystalline mass; wherein the improvement comprises placing in contact with the mass of cubic boron nitride particles an additional metal or metal alloy selected from the group consisting of:
(a) single metals and non-catalytic alloys of such metals which: (i) have a lower melting point than the catalyst; (ii) do not interfere with the function of the catalyst; and (iii) are miscible with the catalyst; and
(b) single metals and non-catalytic alloys of metals as described in (a) above in the form of catalytic alloys with the catalyst, which catalytic alloys do not interfere with the function of the catalyst and at least initially form a catalyst-lean liquid phase during the high pressure/high temperature process.

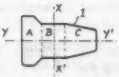
30. A polycrystalline diamond or cubic boron nitride compact containing a catalyst and an additional metal or metal alloy within the interstices between crystal grains and in which compact there is a concentration gradient of the additional metal or metal alloy.

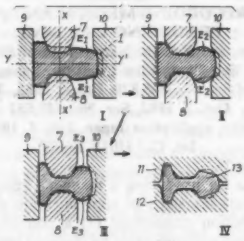
4,518,660

SHAPED BLANKS, METHODS FOR THEIR PRODUCTION AND IMPROVEMENTS TO THE UNIVERSAL ROLLING OF RAILS

André Faessel, Saint-Nicolas en Foret-Hayange; Gabriel B. Mennel, Nilvange, and Jacques M. Michaux, Joeuf, all of France, assignors to Sacilor, France

Filed Oct. 22, 1982, Ser. No. 435,967
Claims priority, application France, Nov. 4, 1981, 81 20689
Int. Cl.³ B21B *1/08, 13/08*
U.S. Cl. 428—577 **19 Claims**





1. A method of forming a primary metallic blank for a rail comprising the steps of:
(a) forming a bloom having a cross-section of generally rectangular configuration with a predetermined height and width; and,
(b) passing the bloom through only open grooves to form a primary blank having a cross-section generally symmetrical about a plane extending parallel to the longer dimen-

sion of the cross-section of the bloom, the cross-section having first, second and third sections wherein:

(i) the first section has five plane faces, two extending parallel to the plane of symmetry and defining the height of the portion; a second extending perpendicular to the plane of symmetry and interconnecting the two parallel faces; and two extending from the two parallel faces and converging toward the plane of symmetry;

(ii) the second section has two plane faces extending from the two convergent faces of the first section generally parallel to the plane of symmetry; and,

(iii) the third section has three plane faces, two extending from the two faces of the second section and converging toward the plane of symmetry and a third face extending generally perpendicular to the plane of symmetry interconnecting the two convergent faces.

8. A primary blank formed from a bloom for subsequently forming a rail, wherein the primary blank has a cross-section that is symmetrical about a plane and comprises:

(a) a first section having five plane faces, two extending parallel to the plane of symmetry and defining the height of the portion; a second extending perpendicular to the plane of symmetry and interconnecting the two parallel faces; and two extending from the two parallel faces and converging toward the plane of symmetry;

(b) a second section having two plane faces extending from the two convergent faces of the first section generally parallel to the plane of symmetry; and,

(c) a third section having three plane faces, two extending from the two faces of the second section and converging toward the plane of symmetry and a third face extending generally perpendicular to the plane of symmetry interconnecting the two convergent faces.

12. A method of forming a secondary metallic blank for a rail comprising the steps of:

(a) forming a bloom having a cross-section of generally rectangular configuration with a predetermined height and width;

(b) passing the bloom through only first open grooves to form a primary blank having a cross-section generally symmetrical about a plane extending parallel to the longer dimension of the cross-section of the bloom, the cross-section having first, second and third sections wherein:

(i) the first section has five plane faces, two extending parallel to the plane of symmetry and defining the height of the portion; a second extending perpendicular to the plane of symmetry and interconnecting the two parallel faces; and two extending from the two parallel faces and converging toward the plane of symmetry;

(ii) the second section has two plane faces extending from the two convergent faces of the first section generally parallel to the plane of symmetry; and,

(iii) the third section has three plane faces, two extending from the two faces of the second section and converging toward the plane of symmetry and a third face extending generally perpendicular to the plane of symmetry interconnecting the two convergent faces;

(c) passing the primary blank through a plurality of universal passes between two vertical and two horizontal rolls without intervening edging passes such that the horizontal rolls reduce the distance between the two plane faces of the second section and the two vertical rolls apply direct pressure against the perpendicular faces of the first and third sections such that metal from the second section moves internally towards the first and third sections and from the perpendicular faces of the first and third sections toward central portions of these sections, respectively, to breakdown the internal solidification structure of the metal and to cause the convergent faces of the third section to expand away from the plane of symmetry; and,

(d) subsequently passing the blank through second open grooves to form the secondary blank.

4,518,661

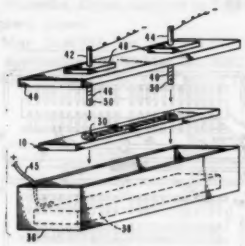
CONSOLIDATION OF WIRES BY CHEMICAL DEPOSITION AND PRODUCTS RESULTING THEREFROM

Ralph E. Rippere, 21420 N. 24th Dr., Phoenix, Ariz. 85027

Filed Sep. 28, 1982, Ser. No. 425,658

Int. Cl.³ B21F *27/08*

U.S. Cl. 428—598 **21 Claims**



1. An electrically conductive body comprising wire crossing wire at multiple sites of mutual contact throughout said body, with said wire interconnected at said sites by a chemical deposition of a metal to yield a rigid, open-wire lattice, and wherein said open-wire lattice is filled with solder to a point of capillary retention.

9. A method of making a conductive body comprising the steps of:

a. forming an open lattice comprising at least three nonwoven layers of wire and having at least a 20% by volume void within the bounds of said lattice;

b. rigidifying said lattice by chemically depositing a metal upon said lattice to bridge sites of mutual contact of said wire within said lattice; and

c. infiltrating said lattice with liquid solder and permitting said solder to cool.

4,518,662

COPPER SOLDER CONTAINING COBALT

Peter Listemann, and Sigurd Mönch, both of Mauren, Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jun. 6, 1984, Ser. No. 617,794

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321437

Int. Cl.³ C22C *9/06*

U.S. Cl. 428—675 **22 Claims**

1. In a copper alloy solder, the improvement which comprises that the solder contains 0.5 to 20% by weight of cobalt 0.05 to 0.5% by weight of carbon, balance copper.

16. A composite solder composition comprising at least one layer of copper and at least one layer of cobalt, wherein the composite contains 0.5–20% by weight of cobalt, 0.05–0.5% by weight of carbon, balance copper.

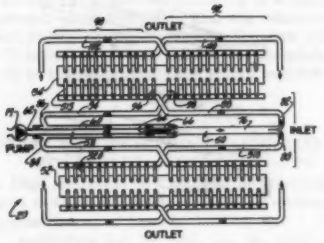
22. A method of soldering steel with hard metal which comprises effecting the soldering with a reactive solder containing a copper layer and at least one separate cobalt layer wherein the solder contains 0.05–20% by weight of cobalt, 0.05–0.5% by weight of carbon balance copper.

4,518,663

ELECTROLYTE CIRCULATION SUBSYSTEM

Satyanarayana Kodali, Troy; Bhim S. Singh, Sterling Heights; Curtis C. Whittlesey, Birmingham, and Gary L. Henriksen, Troy, all of Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jul. 1, 1983, Ser. No. 510,342
Int. Cl.³ H01M *8/02, 12/02*
U.S. Cl. 429—18 **15 Claims**



1. In an electrochemical system having a plurality of cells connected electrically in series, an electrolyte circulation subsystem, comprising:

means for pumping an electrolyte;

manifold means for conveying electrolyte to said cells, said manifold means having an outer tube formed with an outlet port at each end thereof, and an inner tube concentrically disposed within said outer tube generally along one-half of the length of said outer tube, said inner tube being in fluid communication with said pumping means at a first end thereof and in fluid communication with said outer tube at a second end thereof, said inner tube also having means associated with said second end for generally equally diverting the flow of said electrolyte through said inner tube to each of said outlet ports of said outer tube;

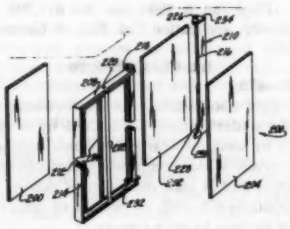
separate conduit means in fluid communication with each of said outlet ports of said outer tube for individually distributing electrolyte from said outlet tube to generally one-half of said cells.

4,518,664

COMB-TYPE BIPOLAR STACK

Curtis C. Whittlesey, Birmingham; Gary L. Henriksen, Troy, both of Mich.; Walter B. Keryluk, Greensboro, and Merle T. Wolff, Lexington, both of N.C., assignors to Energy Development Associates, Inc., Greensboro, N.C.

Filed Jul. 1, 1983, Ser. No. 510,372
Int. Cl.³ H01M *8/02*
U.S. Cl. 429—38 **18 Claims**



1. An electrode assembly, comprising:

a first electrode;

a pair of planar second electrodes disposed in substantially parallel spaced relation to one another, said second electrodes having opposing inwardly facing interior surfaces and outwardly facing exterior surfaces;

a generally rectangular one piece first frame member, defining a pair of spaced apart generally U-shaped and parallel channels, said channels extending substantially around three sides of said first frame member, each channel having an outer channel wall and having a common inner wall which defines a first masking member;

a second frame member insertably carried in said first frame member and defining a second masking member in coplanar relationship with said first masking member;

said second frame member having a nipple at one end thereof and having a clip forming projection at the opposite end thereof;

a hollow tubular feed tube insertably carried at one end thereof in said nipple and retained at the other end thereof by said clip forming projection;

electrode supporting member integrally formed on said first frame member and laterally displaced adjacent said second frame member, said electrode supporting member having an elongated channel for receiving and masking one edge of said first electrode;

said second electrodes being slidably carried in said U-shaped channels and in sandwiching relationship with said second frame member, such that said first and second masking members substantially mask a peripheral portion of said interior surfaces thereof and such that said outer channel walls substantially mask a peripheral portion of said exterior surfaces thereof;

wherein said first and second masking members mask a greater surface area than the surface area masked by said outer channel walls; and

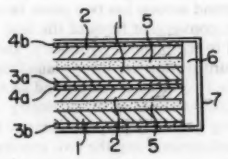
wherein said electrode supporting member defines a third masking member disposed adjacent to and substantially masking a peripheral portion of said exterior surface of one of said second electrodes.

4,518,665

SHEET-SHAPED POLYMER SECONDARY BATTERY OF LAYER BUILT TYPE

Kazunori Fujita, Ibaraki; Shigeoki Nishimura, Katsuta; Hiroyuki Sugimoto; Noboru Ebato, both of Hitachi, and Shinpei Matsuda, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Showa Denko K.K., both of Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 544,118
Claims priority, application Japan, Oct. 20, 1982, 57-182776
Int. Cl.³ H01M *4/60*
U.S. Cl. 429—153 **14 Claims**



1. A sheet-shaped polymer secondary battery of layer built type characterized by being a laminate of a plurality of sheet-shaped unit cells, each of which comprises the following elements (a) to (c):

(a) a positive electrode made of a film-shaped polymer having conjugated double bonds and provided with a thin metal layer at one side of the surface of the film-shaped polymer and capable of reversibly doping and undoping negative ions,

(b) a negative electrode meade of a film-shaped polymer having conjugated double bonds and provided with a thin metal layer at one side of the surface of the film-shaped polymer and capable of reversibly doping and undoping positive ions, and

(c) an insulating porous separator supporting a dopant-containing electrolyte and existing between the positive electrode and the negative electrode so as to be adjacent a side of each of the positive and negative electrodes not having said thin metal layer thereon, and wherein adjacent unit cells of the plurality of unit cells are laminated such that the thin metal layer at the one side of the surface of the positive electrode of one unit cell contacts the thin metal layer at the one side of the surface of the negative electrode of the adjacent unit cell.

4,518,666

ENLARGEMENT OF PHOTOPOLYMER IMAGES IN PHOTOPOLYMER MASK

John A. Quinn, Morganville, and James W. O'Neil, Howell, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1983, Ser. No. 509,702
Int. Cl.³ G03F *9/00*
U.S. Cl. 430—7 **19 Claims**

1. Process of enlarging the image area covered by a stencil or relief image area formed in a photopolymer mask which process consists essentially of

(a) contacting the image area with a swelling agent therefor in the absence of a separate crosslinking agent to effect an equilibrated image enlargement, and

(b) removing excess swelling agent whereby the equilibrated image is fixed in its enlarged state.

11. A process according to claim 1 wherein the image formed in the photopolymer mask is one selected from the group consisting of a halftone image, engineering drawing, and a printed circuit pattern.

4,518,667

AUTOMATIC REPETITIVE REGISTRATION AND IMAGE WISE EXPOSURE OF SHEET SUBSTRATES

Robert B. Heiart, Middletown, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1982, Ser. No. 387,534
Int. Cl.³ G03F *9/00*
U.S. Cl. 430—22 **31 Claims**

1. A process of registering and imagewise exposing to actinic radiation a sequence of similar sheet substrates, each substrate containing a photosensitive layer comprising the steps of:

(1) advancing a substrate to a position in a device to undertake in either order or concurrently

(a) aligning the substrate and a photomask in a predetermined relationship to one another through a hinged relationship of the photomask and the substrate to permit substantially identical alignment of the photomask and each similar sheet substrate of the sequence;

(b) applying a liquid between the photosensitive layer and the photomask;

(2) contacting through the liquid the substrate containing the photosensitive layer and the photomask wherein liquid between the photosensitive layer and the photomask is displaced when the substrate and photomask are brought into more intimate contact by an advancing pressure line whereby during said contacting substantially no movement of the photosensitive layer relative to the photomask occurs other than a more intimate contact due to displacement of the liquid in a liquid layer and whereby at least one of a set of interfacial or viscous forces due to the liquid layer aids in holding the photosensitive layer and photomask in a fixed position relative to one another;

(3) exposing the photosensitive layer to actinic radiation through the photomask;

(4) removing the photomask from the exposed photosensitive layer;

(5) removing the substrate whereby steps 1 to 5 can be repeated; and

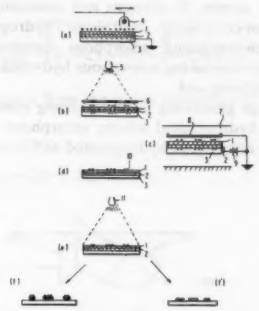
(6) repeating steps 1 to 5 for each of said similar sheet substrates whereby substantially identical imaged substrates are obtained.

4,518,668

METHOD FOR PREPARING A LITHOGRAPHIC PRINTING PLATE

Takao Nakayama, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1983, Ser. No. 478,570
Claims priority, application Japan, Mar. 24, 1982, 57-45558
Int. Cl.³ G03G *1/94, 13/28, 13/00*; C25D *11/34*
U.S. Cl. 430—49 **17 Claims**



1. In a method for preparing a lithographic printing plate using a light-sensitive material comprising an aluminum or aluminum alloy support having a hydrophilic surface provided thereon, in order, a light-sensitive layer and a photoconductive insulating layer, said method comprising the steps of:

electrophotographically forming an electrostatic latent image on the photoconductive insulating layer;

developing the electrostatic latent image with developer particles which have a charge opposite to the charge of the electrostatic latent image and which are opaque to the light to which the light-sensitive layer is sensitive in the presence of an electrode facing the photoconductive insulating layer while applying bias voltage between the electrode and the light-sensitive material so that residual charge on the non-latent areas appears zero and the developer particles are attracted to the latent image;

exposing the light-sensitive layer through the developed image; and

separating the exposed and unexposed areas of the light-sensitive layer together with the photoconductive insulating layer.

4,518,669

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Yuichi Yashiki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,243
Claims priority, application Japan, Nov. 6, 1982, 57-195062; Nov. 12, 1982, 57-198357; Nov. 19, 1982, 57-203955
Int. Cl.³ G03G *5/14*
U.S. Cl. 430—57 **57 Claims**

1. An electrophotographic photosensitive member having an intermediate layer between a substrate and a photosensitive layer, characterized in that the intermediate layer comprises a titanium oxide powder having a coating comprising aluminum oxide or tin oxide on the titanium oxide powder particle and a binder.

4,518,670

RECORDING MATERIAL FOR ELECTROPHOTOGRAPHY COMPRISING AMORPHOUS SILICON CONTAINING NITROGEN

Masatoshi Matsuzaki, Fussa; Toshinori Yamazaki, and Hiroyuki Nomori, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,625
Claims priority, application Japan, Jun. 12, 1982, 57-101085
Int. Cl.³ G03G 5/082
U.S. Cl. 430—58 6 Claims

1. A multilayer recording medium comprising sequentially a substrate, a charge transfer layer and a charge generating layer;

said charge transfer layer being a silicon layer containing at least 1 atomic % nitrogen and consisting essentially of nitrogen-containing amorphous hydrogenated silicon, nitrogen-containing amorphous fluorinated silicon or nitrogen-containing amorphous hydrogenated and fluorinated silicon; and

said charge generating layer consisting essentially of amorphous hydrogenated silicon, amorphous fluorinated silicon or amorphous hydrogenated and fluorinated silicon.

4,518,671

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE Se OR Se ALLOY DOPED WITH OXYGEN

Teruo Misumi, Kawasaki, and Yoichi Osato, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 416,213, Sep. 9, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,623
Claims priority, application Japan, Oct. 7, 1981, 56-159952
Int. Cl.³ G03G 5/082, 5/09, 5/14
U.S. Cl. 430—84 3 Claims

1. An electrophotographic photosensitive member free from fatigue due to repeated use which consists essentially of a photoconductive layer comprising selenium or a selenium alloy and containing doped oxygen in an effective amount up to 8000 ppm or less based on selenium and being prepared by vapor depositing a member selected from the group consisting of selenium or a selenium alloy, said member having oxygen doped therein.

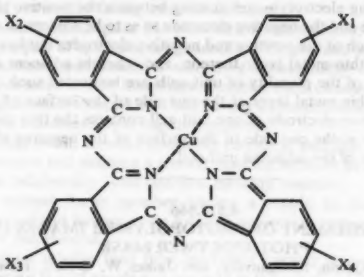
4,518,672

CYAN COLOR TONER FOR DEVELOPING ELECTROSTATIC IMAGE

Motoo Urawa, Funabashi, and Eiichi Imai, Narashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

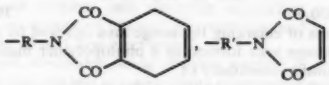
Filed May 16, 1983, Ser. No. 494,866
Claims priority, application Japan, May 21, 1982, 57-86329
Int. Cl.³ G03G 9/10
U.S. Cl. 430—106 9 Claims

1. A cyan toner particle for electrostatic charge development which consists essentially of a compound represented by the general formula [I] shown below, and an electric charge controller, in which the charge polarity of said toner particle is governed by the charge polarity of said charge controller in a binder resin:



[I]

where X_1, X_2, X_3 and X_4 are



or —H, but are not simultaneously hydrogen, and R and R′ are each an alkylene group having from 1 to 5 carbon atoms.

4,518,673

ELECTROPHOTOGRAPHIC DEVELOPER

Koji Noguchi, Saitama; Masumi Asanae, Kumagaya, and Fumio Kimura, Isezaki, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,647
Claims priority, application Japan, Apr. 28, 1982, 57-70523; May 12, 1982, 57-78402
Int. Cl.³ G03G 9/08
U.S. Cl. 430—108 10 Claims

1. A transferable electrophotographic developer which includes a toner comprising a resin component and a coloring agent wherein

(1) said resin component includes (A) 10 to 80% by weight of a styrene-acrylic copolymer and (B) 10 to 80% by weight of a polyester resin, and

(2) said toner has an electric resistance of $10^{13}\Omega$·cm or higher and a triboelectrification quantity of 5 μC/g or less or +5 μC/g or more.

4,518,674

DEVELOPING MATERIAL FOR ELECTROPHOTOGRAPHY, PROCESS FOR PREPARATION

Shotaro Watanabe; Makoto Tomono; Goichi Yamakawa, all of Tokyo; Takeo Nishimura, Saitama, and Nobuo Takahashi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 196,057, Oct. 10, 1982, abandoned, which is a continuation of Ser. No. 922,235, Jul. 5, 1978, abandoned. This application Mar. 26, 1984, Ser. No. 592,752
Claims priority, application Japan, Jul. 5, 1977, 52-80061
Int. Cl.³ G03G 9/10
U.S. Cl. 430—108 8 Claims

1. A process for the preparation of iron powder developer carriers for electrophotography, which comprises the steps of subjecting a starting iron powder pulverized to a particle size smaller than 50μ to a primary calcination treatment at a temperature of 900° to 1200° C. in an inert gas atmosphere or reducing gas atmosphere without using a binder, to thereby form a calcination product, pulverizing and classifying said calcination product to prepare an intermediate iron powder having a particle size of 50 to 200μ, if necessary, reducing the intermediate iron powder in a reducing atmosphere and wash-

ing the intermediate iron powder with at least one member selected from the group consisting of water, a solution containing surface active agents and organic solvents, and subjecting the intermediate iron powder to an oxidizing calcination treatment at a temperature of 280° to 390° C. said process being free of the application of a coating to said powder particles.

4,518,675

STRIPPER FOR RADIOSENSITIVE RESIST

Mutsuo Kataoka, Kamakura, Japan, assignor to Toray Industries, Inc., Japan

Filed Feb. 14, 1983, Ser. No. 466,330

Claims priority, application Japan, Feb. 15, 1982, 57-21288

Int. Cl.³ G03C *11/12*; C11D *1/18*; B08B *7/00*

U.S. Cl. 430—256 **21 Claims**

1. A stripper for a radiosensitive resist formed of a fluoroalkyl alpha-haloacrylate polymer, said stripper consisting essentially of a substantially non-aqueous polar solvent of dimethyl sulfoxide, and 0.1 to 40 weight percent of at least one compound selected from the group consisting of alkali metal alkoxides and tetraalkylammonium hydroxides, said stripper further characterized as being used with a post-stripping water rinse and useful at room temperature.

4,518,676

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING DIARYLIODOSYL SALTS

Edward Irving, Burwell, England, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,800

Claims priority, application United Kingdom, Sep. 18, 1982, 8226707; Jun. 10, 1983, 8315926

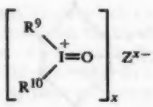
Int. Cl.³ G03C *1/68*

U.S. Cl. 430—280 **15 Claims**

1. A photopolymerizable composition consisting essentially of

(a) a cationically polymerizable material, and

(b) as photoinitiator, 0.01 to 10% by weight, based on component (a), of a diaryliodosyl salt of the formula



where

R^9 and R^{10}, which may be the same or different, each represent a monovalent aromatic radical of from 4 to 25 carbon atoms,

x represents 1, 2, or 3, and

Z^{x-} denotes an x-valent anion of a protic acid.

4,518,677

PROCESS FOR MAKING PRINTING PLATES

Rudolph L. Pohl, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 394,565, Jul. 2, 1982, Pat. No. 4,442,302, which is a continuation-in-part of Ser. No. 175,171, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,778, Mar. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 866,964, Jan. 4, 1978, abandoned. This application Apr. 9, 1984, Ser. No. 598,113

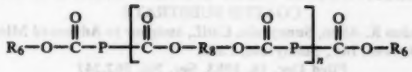
Int. Cl.³ G03F *7/02*; G03C *5/24*

U.S. Cl. 430—306 **3 Claims**

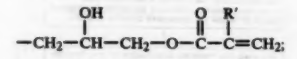
1. The process of making a printing relief which comprises:

(A) admixing the components of a photopolymer composition comprising:

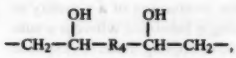
(1) a liquid terminally olefinically unsaturated linear polymer having the structure

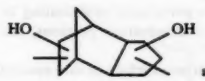


wherein P is a polymer residue having a number average molecular weight of at least about 1000, selected from the group consisting of homopolymers of butadiene, isoprene, chloroprene and isobutylene and copolymers of butadiene with styrene, butadiene with acrylonitrile, butadiene with isoprene and ethylene with 1-butene, and the corresponding saturated residues; R_6 is

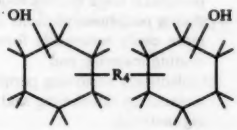


R_8 is selected from the group consisting of



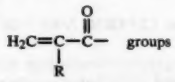


and



where each —OH group and free valence bond is on an adjoining carbon atom; R_4 is selected from the group consisting of aliphatic hydrocarbon, cycloaliphatic hydrocarbon and monocyclic aromatic hydrocarbon radicals containing up to 30 carbon atoms with 0–2 ester linkages or 0–7 ether linkages; R' is selected from the group consisting of —H and —CH_3 groups; and n = 1–5;

(2) from about 1 to about 50% by weight based on the weight of the polymer of at least one ethylenically unsaturated monomer selected from the group consisting of acrylonitrile, methacrylonitrile, styrene, methyl substituted styrene, N-vinyl-pyrrolidone, and monomers containing one or more



groups

wherein R is hydrogen or a C_1–C_3 alkyl group;

(3) from about 0.05 to about 10% by weight based on the weight of the polymer of a photoinitiator; and

(4) from about 0.01 to about 2% by weight based on the weight of the polymer of a stabilizer;

(B) spreading the photopolymer composition in a layer on a support to form a photopolymer element;

(C) exposing to actinic light selected areas of said layer on said support until substantial cross-linking takes place in the exposed areas without significant cross-linking in the unexposed areas; and

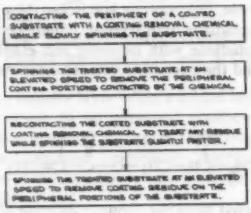
(D) removing the unexposed areas of photopolymer composition by washing the photopolymer element with an aqueous detergent solution.

4,518,678

SELECTIVE REMOVAL OF COATING MATERIAL ON A COATED SUBSTRATE

Landon K. Allen, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1983, Ser. No. 562,241
Int. Cl.³ B05D *3/12;* **G03C** *1/76, 3/00*
U.S. Cl. 430—311 **12 Claims**


CONTACTING THE PERIPHERY OF A COATED SUBSTRATE WITH A COATING REMOVAL CHEMICAL WHILE SLOWLY SPINNING THE SUBSTRATE.
SPINNING THE TREATED SUBSTRATE AT AN ELEVATED SPEED TO REMOVE THE PERIPHERAL COATING PORTIONS CONTACTED BY THE CHEMICAL.
RECONTACTING THE COATED SUBSTRATE WITH COATING REMOVAL CHEMICAL TO TREAT ANY RESIDUE WHILE SPINNING THE SUBSTRATE AT AN ELEVATED SPEED.
SPINNING THE TREATED SUBSTRATE AT AN ELEVATED SPEED TO REMOVE COATING RESIDUE ON THE PERIPHERAL PORTIONS OF THE SUBSTRATE.

1. An improved process for the production of a plurality of semiconductor devices from a single substrate wherein a substrate is coated with a photosensitive coating material, exposed to a selective light pattern, and then treated with a chemical developer to remove portions of said coating to permit further processing of selective substrate portions, the improvement comprising:

(a) exposing at least one surface of said substrate adjacent the peripheral edge thereof to a light pattern capable of rendering peripheral portions of said coating material into a more easily removable form than the remainder of said coating material; and

(b) selectively removing peripheral portions of said coating material by developing said exposed photosensitive coating material;

whereby the removal of said coating material from the peripheral edge of the substrate mitigates the inadvertent dislodgement of coating particles from the peripheral portion of said substrate during subsequent processing of said coating substrate.

4,518,679

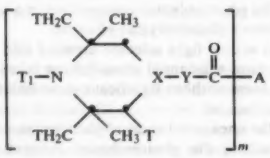
COLOR-PHOTOGRAPHIC RECORDING MATERIAL

David G. Leppard, Marly, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 2, 1983, Ser. No. 557,366
Claims priority, application Switzerland, Dec. 3, 1982, 7046/82
Int. Cl.³ G03C *7/40, 7/26*
U.S. Cl. 430—372 **14 Claims**

1. A colour-photographical recording material which, in at least one light-sensitive silver halide emulsion layer, one intermediate layer and/or one protective layer, contains, as a stabilizer, a light stabilizing amount of at least one polyalkylpiperidine compound, wherein the polyalkylpiperidine compound has one of the formulae I or II

(I)



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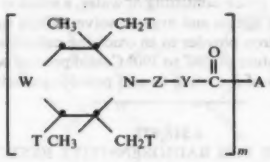
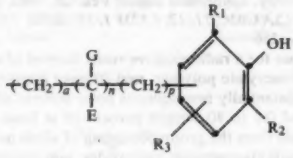
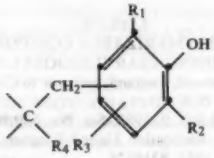
(II)



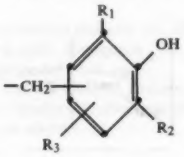
in which m is 1 or 2, if m=1, A is a group of the formula



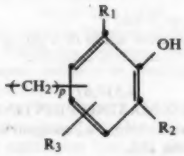
and, if m=2, A is a group of the formula



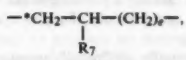
in which R_1 is hydrogen, C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, C_7–C_9-phenylalkyl, phenyl or C_7–C_{10}-alkylphenyl, R_2 is C_1–C_8-alkyl, C_5–C_8-cycloalkyl, C_7–C_9-phenylalkyl, phenyl or C_7–C_{10}-alkylphenyl, R_3 is hydrogen or methyl, R_4 is hydrogen, C_1–C_{12}-alkyl, allyl, benzyl, cyclohexyl or a group



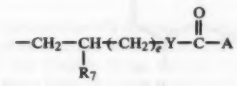
G is hydrogen or a group



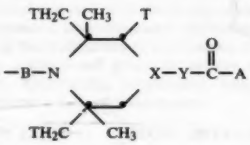
E is hydrogen, methyl, —CN, —COR_5 or —$COOR_5$, R_5 being C_1–C_8-alkyl or C_3–C_4-alkoxyalkyl, and n and p independently of one another are 0 or 1 and a is 0, 1 or 2, y is —O— or —$N(R_6)$—, R_6 being hydrogen, C_1–C_{18}-alkyl, C_3–C_{12}-alkenyl, C_5–C_8-cycloalkyl, phenyl, C_7–C_{14}-alkaryl, C_7–C_{14}-aralkyl or C_3–C_4 alkoxyalkyl, Z is a group



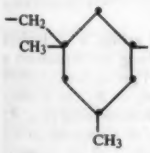
in which R_7 is hydrogen, methyl, ethyl, phenoxymethyl, phenyl or —OR_8, but is only —OR_8 if e is 1, and in which R_8 is hydrogen or —COL, L is C_1–C_4-alkyl, e is 0 or 1 and the •C is attached at the piperidine nitrogen, T is hydrogen or methyl, T_1 is hydroxyl, C_1–C_{12}-alkyl, C_3–C_6-alkenylmethyl or C_3–C_4-alkynylmethyl and C_7–C_{14}-aralkyl, glycidyl, C_1–C_4-alkyl which is substituted by halogen, cyano, —$COOR_9$ or —$CON(R_{10})(R_{11})$, a group —COR_{12}, —$COOR_9$ or —$CON(R_{10})(R_{11})$ or a group —CH_2—$CH(R_{13})$—OR_{14}, —SOR_{15}, —SO_2R_{15}, —OR_9 or —$OOCR_{12}$ in which R_9 is C_1–C_{12}-alkyl, allyl, cyclohexyl or benzyl, R_{10} is C_1–C_{12}-alkyl, allyl, cyclohexyl, benzyl, phenyl or C_7–C_{10}-alkylphenyl and R_{11} is hydrogen, C_1–C_{12}-alkyl, allyl, cyclohexyl or benzyl, or R_{10} and R_{11}, together with the N atom to which they are attached, form a 5-membered or 6-membered heterocyclic ring, R_{12} is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, chloromethyl, C_5–C_8-cycloalkyl, C_7–C_{14}-aralkyl, phenyl, C_7–C_{10}-alkylphenyl or phenyl, phenylmethyl or phenylethyl which is substituted by one or two C_1–C_4-alkyl groups and by one hydroxyl group, R_{13} is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkoxyalkyl, phenyl or phenoxymethyl, R_{14} is hydrogen, C_1–C_{12}-alkyl or a group —COR_{12} or —$CON(R_{10})(R_{11})$ and R_{15} is C_1–C_{12}-alkyl, phenyl or C_7–C_{10}-alkylphenyl, or T_1 is a group of the formula

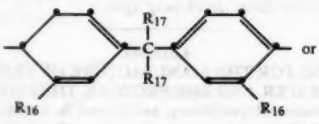


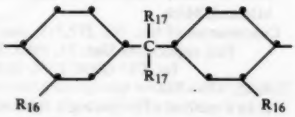
or of the formula



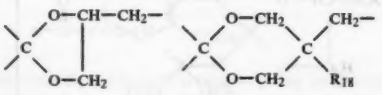
in which B is a group C_rH_{2r} in which r is an integer of from 2 to 12, or is C_4–C_8-alkenylene, C_4–C_8-alkynylene, phenylene, xylylene, bitolylene, C_5–C_{12}-cycloalkylene or a group —CONH—B_1—NECO— in which B_1 is a group C_rH_{2r}, phenylene, naphthylene, tolylene or a group of the formulae

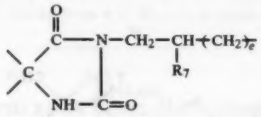


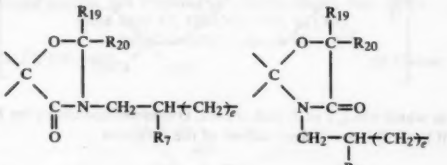


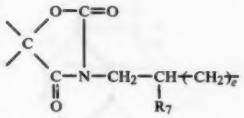


in which R_{16} is hydrogen or methyl and R_{17} is hydrogen, methyl or ethyl, X is one of the groups

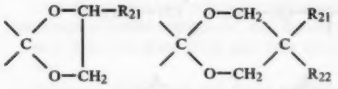


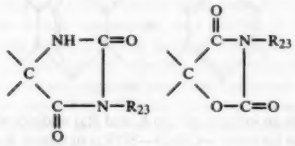


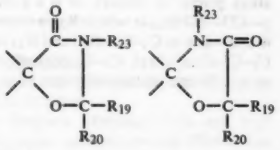




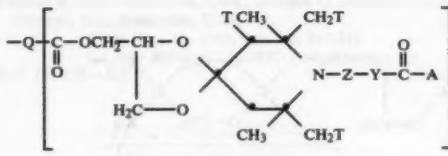
and W is one of the groups



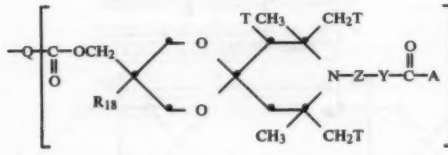




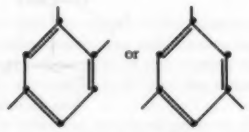
in which R_{18} is methyl or ethyl, R_{19} is hydrogen, C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl or C_7–C_{14}-aralkyl, R_{20} is C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl or phenyl, or R_{19} and R_{20}, together with the C atom to which they are attached, form a C_5–C_{12} cycloalkane or alkylcycloalkane ring, R_{21} is hydrogen, C_1–C_{12}-alkyl or a group of the formula —CH_2—$OCOR_{24}$ in which R_{24} is hydrogen, C_1–C_4-alkyl, C_2–C_6-alkenyl, cyclohexyl, phenyl, benzyl or chloromethyl, or is a group —CH_2—O—SO_2R_{27} in which R_{27} is methyl, phenyl or p-tolyl, or is one of the groups



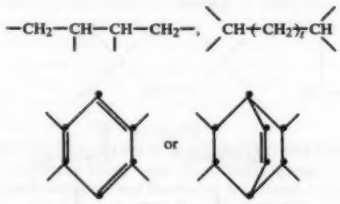
or



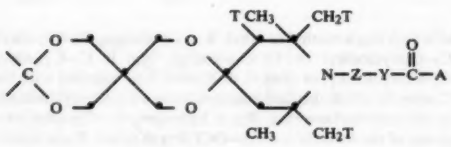
in which s is 1, 2 or 3, and, if s=1, Q is as defined above for B, if s=2, Q is a trivalent radical of the formulae



and, if s=3, Q is a tetravalent radical of the formulae



in which t is an integer of 1 to 8, and R_{21} additionally is also a group of the formula $—CH_2O—SOR_{25}$ in which R_{25} is C_1–C_4-alkyl, p-tolyl or phenyl, or is a group of the formula $—CH_2—CO—NHR_{26}$ in which R_{26} is hydrogen or C_1–C_4-alkyl, R_{22} is hydrogen or C_1–C_4-alkyl and R_{23} is hydrogen, C_1–C_{12}-alkyl, C_3–C_4-alkoxyalkyl, C_5–C_8-cycloalkyl, allyl or benzyl, and, if m is 1, W can additionally also be a group of the formula



the radicals and symbols mentioned several times always being as defined initially.

4,518,680

BLEACH-FIXING SOLUTION AND PROCESSING OF LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL BY USE THEREOF

Shigeharu Kobosbi; Masao Ishikawa; Kazuhiro Kobayashi; Toshihiko Kimura, and Moeko Higuchi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,551

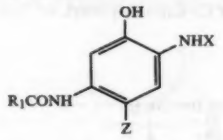
Claims priority, application Japan, Feb. 17, 1983, 58-23766; Feb. 18, 1983, 58-24863

Int. Cl.³ G03C *7/00, 5/38, 7/34*

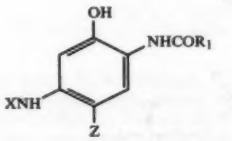
U.S. Cl. 430—393 **12 Claims**

1. A method for processing a light-sensitive silver halide color photographic material, which comprises developing an imagewise exposed light-sensitive silver halide color photographic material containing a cyan coupler and then bleach fixing with a bleach-fixing solution containing a diethylenetriamine pentaacetic acid iron III complex salt and a fixing agent and having a pH value of 4 or higher; said cyan coupler being at least one cyan coupler represented by the formula (I) or the formula (II) shown below:

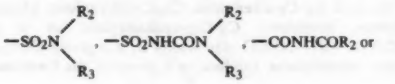
Formula (I)



Formula (II)



wherein X is $—COR_2$, $—CON(R_2)(R_3)$, $—SO_2R_2$, $—C(=S)—N(R_2)(R_3)$,



$—CONHSO_2R_2$,

R_2 represents an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic ring; R_3 represents a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic ring or R_2 and R_3 may be bonded to each other to form a 5- to 6-membered ring, R_1 is a ballast group, Z is a hydrogen atom or an eliminable group through coupling with the oxidation product of an aromatic primary amine color developing agent.

4,518,681

PROCESS FOR THE MANUFACTURE OF SYNTHETIC PAPER AND THE PRODUCT THEREOF

Oscar Johnson, Reynoldsburg, and Robert A. Luecke, Newark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 277,318, Jun. 25, 1981, abandoned. This application Dec. 23, 1983, Ser. No. 571,121

Int. Cl.³ G03C *1/76;* **B05D** *3/06*

U.S. Cl. 430—532 **8 Claims**

1. In a method of preparing a synthetic film having adhered thereto a photographic gel emulsion wherein the synthetic film comprises a blend comprising a styrene polymer resin, an ethylene polymer resin, and an inorganic filler, the improve-

ment which comprises utilizing titanium dioxide as the sole inorganic filler and oxidizing at least one surface of the film so-prepared, thereby obtaining a synthetic film having the capability of enhanced adhesion to a photographic gel emulsion and adhering a layer of photographic gel emulsion to said oxidized surface of said synthetic film.

4,518,682

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hidetoshi Kobayashi; Toshiro Takahashi; Shigeo Hirano; Takeshi Hirose, and Keiichi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 15, 1983, Ser. No. 532,631

Claims priority, application Japan, Sep. 16, 1982, 57-161515

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—543 **11 Claims**

1. A silver halide photographic light-sensitive material, comprising:

a support having positioned thereon:

a light-sensitive silver halide emulsion layer; and

a compound represented by the general formula (I):

A-B (I)

wherein A is a residue of a compound capable of undergoing a coupling reaction with an oxidized primary amine developer, the residue being derived by eliminating a hydrogen atom from an active position of the compound; and

B is a group capable of being released through a coupling reaction to exert a fogging effect wherein B is a residue of a thiocarbonyl selected from the group consisting of thioureas, thioamides, thiocarbamates, dithiocarbamates, rhodanines and thiohydantoins or is a residue of a compound containing a functional group or moiety selected from hydrazines, hydrazones, polyamines, enamines, acetylenes, quaternary salts and aldehydes.

4,518,683

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kazuo Kato, Hino; Fumio Hamada, Fussa, and Kenji Ito, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,114

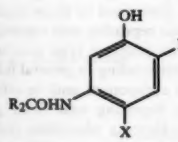
Claims priority, application Japan, Sep. 2, 1982, 57-153551

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—546 **15 Claims**

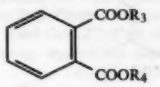
1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer and a non-light-sensitive layer adjacent to said silver halide emulsion layer, wherein said silver halide emulsion layer contains a cyan coupler having the following Formula [I] and a compound having the following Formula [II], and further said non-light-sensitive layer contains a compound having said Formula [II];

Formula [I]



wherein X is a hydrogen atom or a group which can be split off by the coupling reaction with the oxidized product of an aromatic primary amine color developing agent; R_1 is an aryl group or a heterocyclic group; and R_2 is a ballasting group necessary to cause said cyan coupler having said Formula [I] and the cyan dye formed from said cyan coupler to be nondiffusible;

Formula [II]



wherein R_3 and R_4 each is an alkyl group, an alkenyl group, or a cycloalkyl group each having from 3 to 20 carbon atoms, or an aryl group having from 6 to 20 carbon atoms.

4,518,684

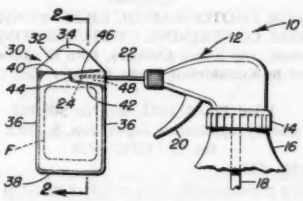
RAPID X-RAY DEVELOPING SYSTEM

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20910

Filed May 17, 1984, Ser. No. 611,481

Int. Cl.³ G03C *5/24, 1/48*

U.S. Cl. 430—403 **10 Claims**



1. A rapid X-ray developing system, comprising:

a film package component, said film package component having a pouch-like enclosure and an adjacent separate pocket therewithin;

a seal means, said seal means being suitably affixed to the inside of said separate pocket;

an unexposed X-ray film, said unexposed X-ray film being enclosed within said pouch-like enclosure;

an injection means component, said injection means component being separate from said film package component; and

a combined developing and fixing solution, said combined developing and fixing solution being contained within said injection means component, said combined developing and fixing solution being inserted into said pouch-like enclosure through said injection means component being inserted into said separate pocket at a selected time when said unexposed X-ray film has been exposed and is ready for processing, said injection means component being withdrawn thereafter.

4,518,685

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara; Akihiko Ikegawa; Mitsunori Ono, and Yuji Mihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1984, Ser. No. 601,402

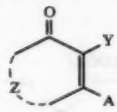
Claims priority, application Japan, Apr. 18, 1983, 58/68007

Int. Cl.³ G03C *1/46, 1/02*

U.S. Cl. 430—505 **34 Claims**

1. A silver halide photographic light-sensitive material which comprises a support having thereon a light-sensitive silver halide emulsion layer, wherein the photographic light sensitive material therein contains a blocked photographic agent represented by the formula (I):

(I)



wherein A represents a photographic agent moiety which is bonded to a blocking moiety through a hetero atom or a group which is bonded to a blocking moiety through a hetero atom and capable of releasing a photographic agent upon a subsequent reaction after the group is released; Y represents a hydrogen atom or a substituent; and Z represents an atomic group necessary to form a carbocyclic ring or a heterocyclic ring.

4,518,686

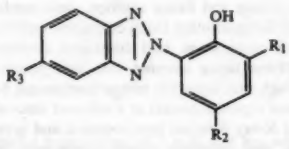
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING UV FILTER COMPOUNDS

Masao Sasaki, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,963
Claims priority, application Japan, Jun. 5, 1982, 57-96814
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—512 **7 Claims**

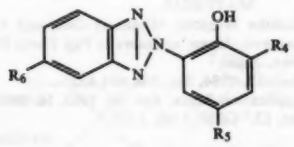
1. A color photographic light-sensitive material comprising a reflective support having thereon a plurality of silver halide emulsion layers of which the emulsion layer located farthest from said support has, on each of both the support side thereof and the uppermost side at least one nonlight-sensitive layer containing an effective amount of an ultraviolet absorbing agent, said ultraviolet absorbing agent being used in said nonlight-sensitive layer on the uppermost side of said emulsion layer being a 2-(2'-hydroxyphenyl)benzotriazole-type compound which is in the liquid form at normal room temperature, and wherein said 2-(2'-hydroxyphenyl)benzotriazole-type compound is selected from the group consisting of

Formula [I]



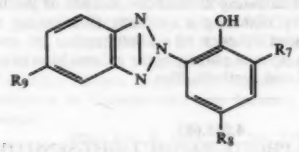
wherein R_1 and R_2 independently represent an alkyl, an aryl, an alkoxy and an aryloxy radical, R_3 represents a hydrogen atom, a halogen atom, an alkyl, an aryl, an alkoxy, an aryloxy, an alkenyl, a nitro or a hydroxy radical;

Formula (II)



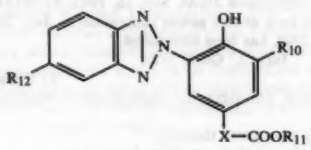
wherein R_4 represents a methyl, ethyl or propyl radical, R_5 represents a secondary alkyl having from 4 to 10 carbon atoms, R^6 represents a hydrogen atom, a halogen atom, an alkyl, or an alkoxy radical having from 1 to 8 carbon atoms;

Formula (III)



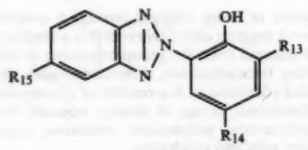
wherein R_7, R_8 and R_9 independently represent an alkyl radical having from 4 to 10 carbon atoms, provided that at least one of R_7, R_8 and R_9 represents a secondary alkyl;

Formula (IV)



wherein R_{10} represents a secondary or tertiary alkyl having from 1 to 8 carbon atoms, X represents an alkylene having from 1 to 6 carbon atoms, R_{11} represents an alkyl group having from 1 to 12 carbon atoms, R_{12} represents a hydrogen atom, a halogen atom, an alkyl or an alkoxy radical having from 1 to 8 carbon atoms; and

Formula (V)



wherein R_{13} and R_{14} independently represent a secondary alkyl having from 4 to 10 carbon atoms and R_{15} represents a hydrogen atom, a halogen atom and an alkoxy radical having from 1 to 8 carbon atoms.

4,518,687

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsumoru Hirano; Makoto Umemoto, and Mitsunori Hirano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

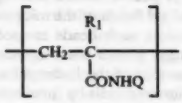
Filed Oct. 7, 1983, Ser. No. 539,857
Claims priority, application Japan, Oct. 7, 1982, 57-176748
Int. Cl.³ G03C *7/26*
U.S. Cl. 430—548 **17 Claims**

1. A silver halide color photographic light-sensitive material, comprising:

a support base having thereon;

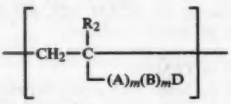
a silver halide emulsion layer containing a cyan dye-forming oleophilic polymer coupler comprised of three repeating units including a cyan coupler repeating unit corresponding to general formula (I), an ethylene type unsaturated monomer repeating unit corresponding to general formula (II) which contains an acid component and an ethylene type unsaturated monomer repeating unit from group (III); wherein the cyan dye-forming oleophilic polymer coupler is prepared by dissolving the monomeric components thereof in an organic solvent and polymerizing the same therein and is present in the form of a dispersed product, said polymer coupler having been dissolved in an organic solvent followed by emulsion dispersion in a gelatin aqueous solution in the presence of a surfactant;

(I)



wherein R_1 represents a hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or a chlorine atom, and Q represents a cyan coupler residue capable of forming a dye upon coupling with an oxidized aromatic primary amine developing agent;

(II)



wherein R_2 represents a hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or a chlorine atoms, a represents —COO— or —CONH—, B represents an alkylene, aralkylene or phenylene group containing 1 to 10 atoms, and the alkylene group may be straight chain, branched chain or cyclic, D represents —COOM or —SO_3M, M represents a hydrogen atom or an alkali metal, and m represents 0 to 1; and wherein the ethylene type unsaturated monomer from group (III) is an ester of acrylic acid other than methyl acrylate, an amide of acrylic acid, an ester of α-chloroacrylic acid, an amide of α-chloroacrylic acid, an ester of α-alkacrylic acid, an amide of α-alkacrylic acid, a vinyl ester or styrene.

4,518,688

COLOR-PHOTOGRAPHIC RECORDING MATERIAL

David G. Leppard, Marly, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 25, 1983, Ser. No. 555,633

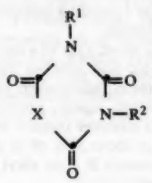
Claims priority, application Switzerland, Nov. 26, 1982, 6894/82

Int. Cl.³ G03C *7/26*

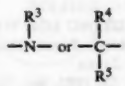
U.S. Cl. 430—551 **10 Claims**

1. A colour-photographic recording material which, in at least one light-sensitive silver halide emulsion layer, one intermediate layer, one image-receiving layer and/or one protective layer, contains, as a stabiliser, a light stabilising amount of at least one compound of the formula I

(I)



in which X is a group



and R^1, R^2, R^3, R^4 and R^5 are monovalent organic radicals, at least one of which contains a sterically hindered phenol group and at least one of which contains a polyalkylpiperidine group.

4,518,689

SPECTRALLY SENSITIZED INNER LATENT IMAGE TYPE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Yasuhiro Noguchi, and Yuji Mihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1983, Ser. No. 546,125

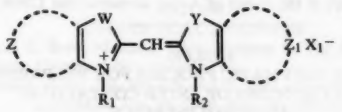
Claims priority, application Japan, Oct. 27, 1982, 57-188594

Int. Cl.³ G03C *1/14*

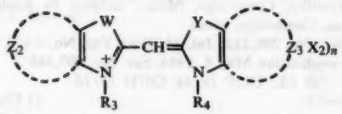
U.S. Cl. 430—574 **11 Claims**

1. An inner latent image type silver halide photographic emulsion which is spectrally sensitized by adding at least one monomethine cyanine dye represented by general formula (II) to a direct positive inner latent image type silver halide photograhic emulsion and thereafter adding additionally at least one monomethine cyanine dye represented by general formula (I) to said emulsion

(I)



(II)



wherein W and Y, which may be identical or different from each other, each represents an oxygen atom, a selenium atom, a sulfur atom or

wherein R_5 represents a lower alkyl group which is unsubstituted or substituted by a halogen atom or a lower alkoxy group, or an allyl group, Z, Z_1, Z_2 and Z_3 each represents an atomic group necessary to form a benzene ring or naphthalene ring, R_1 and R_2 each represents an unsubstituted alkyl group, a haloalkyl group, an alkoxyalkyl group, an aralkyl group, an aryloxyalkyl group or an allyl group, R_3 and R_4 each represents an alkyl group substituted with a carboxyl group or a sulfo group, but at least one of R_3 and R_4 represents an alkyl group substituted with a sulfo group, X_1 represents an anion, X_2 represents a cation, and n is 0 or 1.

4,518,690

DNA PROMOTER SEQUENCE OF AVIAN TUMOR VIRUS AND USE THEREOF FOR ENHANCED GENE EXPRESSION IN *E. COLI*

Ramareddy V. Guntaka, Teaneck, N.J., assignor to Research Corporation, New York, N.Y.

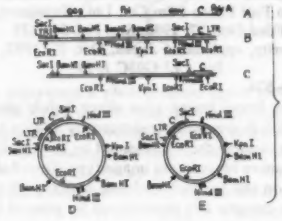
Continuation of Ser. No. 145,390, Apr. 30, 1982, abandoned. This application Sep. 27, 1982, Ser. No. 424,631

Int. Cl.³ C12P *21/04, 21/00, 21/02;* C12N *15/00, 1/20, 1/00;* C07H *15/12*

U.S. Cl. 435—71 **25 Claims**

1. A molecule of double-stranded DNA having a length of

about 35 base pairs useful as a promoter of gene expression in *E. coli*, which molecule has the base pair sequence which binds



E. coli RNA polymerase, said sequence being found in the first 150 base pairs at the 3'-end of Avian sarcoma viral DNA.

4,518,691

IN VITRO ENZYMATIC PROCESS FOR PREPARING GLUCURONIDES OF ESTER-CONTAINING ANTICHOLINERGICS

Walter C. Herlihy, Cambridge, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Division of Ser. No. 398,212, Jul. 14, 1982, Pat. No. 4,471,111. This application May 4, 1984, Ser. No. 607,348

Int. Cl.³ C12P *19/44*; C07H *15/18*

U.S. Cl. 435—74 **14 Claims**

1. An in vitro enzymatic process for preparing the O-β-D-glucuronic acid of an ester-containing anticholinergic compound having a primary alcohol which comprises:

(a) substantially removing esterases from liver microsomes;

(b) incubating said treated liver microsomes in the presence of:

(1) a suitable buffer to maintain the pH at about 7 to about 8.5;

(2) an ester-containing anticholinergic compound having a primary alcohol; and

(3) uridine 5'-diphosphoglucuronic acid, for a sufficient time to conjugate the aglycon with glucuronic acid, and

(c) isolating the desired O-β-D-glucuronic acid of said ester-containing anticholinergic compound having a primary alcohol.

4,518,692

PRODUCTION OF L-AMINO ACIDS BY TRANSAMINATION

J. David Rozzell, Cambridge, Mass., assignor to Genetics Institute, Inc., Boston, Mass.

Filed Sep. 1, 1983, Ser. No. 528,730

Int. Cl.³ C12P *13/06, 13/04, 13/22, 13/08, 13/12*

U.S. Cl. 435—116 **17 Claims**

1. A process for producing alpha amino acids or derivatives thereof, said process comprising reacting an alpha-keto acid with L-aspartic acid in the presence of transaminase enzyme to produce (1) an alpha amino acid corresponding to said alpha-keto acid and (2) oxaloacetate; and decarboxylating said oxaloacetate.

4,518,693

IMMOBILIZED BIOCATALYSTS

Wei-Youh Kuu, Baton Rouge, La., assignor to Research Corporation, New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 437,945

Int. Cl.³ C12N *11/10, 11/04*; C12P *7/06*

U.S. Cl. 435—178 **5 Claims**

1. A method for immobilization of microbial cells comprising:

(a) forming a solution of an agar or carrageenan hydrogel;

(b) introducing microbial cells into the hydrogel solution, said microbial cells being at temperature 40°–48° C. when agar is used, and 37°–50° C. when ccarrageenan is used;

(c) forming spherical gel beads of the microbial cell containing hydrogel solution, such beads created by contacting the hydrogel solution with a water-immiscible liquid at a temperature below that of the hydrogel solution;

(d) activating the microbial cells by incubating the spherical beads containing culture for 12–50 hours, such incubation resulting in the formation of colonies of microbial cells in the spherical beads which produce CO_2 thereby decreasing resistance of the beads to diffusion;

(e) diffusing the monomer, acrylamide (ACAM), the cross-linking agent, N,N'-methylene-bis-acrylamide (BIS), and the accelerator, β-dimethylaminopropionitrile (DMAPN) or N,N,N',N'-tetramethylenediamine (TEMED) into the beads by introducing the ACAM, BIS, and DMAPN or TEMED to the gel beads in solution;

(f) after diffusion removing the solution of ACAM, BIS and either DMAPN or TEMED;

(g) contacting the gel beads with a polymerization initiator selected from the group consisting of $K_2S_2O_8$ and $(NH_4)_2S_2O_8$ to cause polymerization;

(h) sparging the solution with nitrogen during polymerization;

(i) stirring the beads so as to increase uptake of polymerization initiator, and;

(j) washing the polymerized beads with water to remove unpolymerized molecules.

4,518,694

AQUEOUS COMPOSITIONS CONTAINING STABILIZED ENZYMES

Elias H. Shaer, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Continuation of Ser. No. 173,779, Jul. 30, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,552

Int. Cl.³ C12N *9/96*

U.S. Cl. 435—188 **19 Claims**

1. An aqueous-based enzyme containing composition wherein the enzymes have enhanced stability against loss of activity, the composition comprising on a weight basis:

(a) from about 0 to about 55% of a surfactant selected from the group consisting of anionic and nonionic surfactants, and mixtures thereof;

(b) from about 0.006 to about 5% of an active enzyme selected from the group consisting of protease and alpha amylase enzymes, and mixtures thereof, said enzyme being provided in pure form or as incorporated within a commercial enzyme preparation comprising from about 2 to about 80% of said enzyme and from about 20 to about 98% of a carrier therefor;

(c) an enzyme stabilizer consisting essentially of on a weight basis of said composition:

(i) from about 0.5 to about 15% of a salt of a lower molecular weight organic acid selected from the group consisting of alkali metal, ammonium and alkanol ammonium salts of formic, acetic, propionic, butyric, and valeric acids, and mixtures thereof, and

(ii) from about 1.0 to about 25% of an alcohol having the formula ROH wherein R is an alkyl having one to six carbon atoms, and

(d) from about 10 to about 90% water.

4,518,695

PROCESS FOR ELUTING EGG WHITE LYSOZYME

Mineo Hasegawa, Hachioji, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 443,956

Claims priority, application Japan, May 29, 1982, 57-91879

Int. Cl.³ C12N *9/36*

U.S. Cl. 435—206 **11 Claims**

1. In a process for eluting egg white lysozyme by contacting

a weakly acidic cation exchange resin having egg white lysozyme adsorbed thereon with an eluting agent comprising a salt solution having a pH of about 6.5 to 8.0, the improvement wherein an alkali agent is added to the mixture of the weakly acidic cation exchange resin having egg white lysozyme adsorbed thereon and the eluting agent in a quantity such that the pH of the mixture during elution is between about 6.5 and 8.0.

4,518,696

STABILIZED LIQUID BACTERIAL SUSPENSION FOR ORAL ADMINISTRATION TO ANIMALS

Sybil H. Gehrman, and Randolph S. Porubcan, both of West Allis, Wis., assignors to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

Filed Jan. 11, 1983, Ser. No. 457,226

Int. Cl.³ C12N *1/20, 1/04;* C12R *1/225, 1/23*

U.S. Cl. 435—253 **4 Claims**

1. A stabilized liquid bacterial composition for administration to animals, consisting essentially of anhydrous sunflower seed oil having dispersed therein dried viable cells of animal-probiotic Lactobacilli together with a sufficient amount of fumed silica to maintain said cells in anhydrous suspension, said suspension containing from 1×10^8 to 1×10^{10} colony forming units (CFU) of said cells per cubic centimeter of the oil suspension, said cells having been prepared for addition to said oil by drying under conditions favorable to cell stability to a water activity (a_w) below 0.20.

4,518,697

ACID STABLE PROTEASE FROM MUTANTS OF GENUS ASPERGILLUS

Friedhelm Bartnik, Düsseldorf; Joachim Schindler, Hilden; Albrecht Weiss, Erkrath, and Rolf Schmid, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,415

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1981, 3149457

Int. Cl.³ C12N *1/14, 9/62;* C12R *1/685*

U.S. Cl. 435—254 **1 Claim**

1. A mutant form of the wild fungus strain *Aspergillus niger* var. tienhem CBS 319.81 selected from the group consisting of mutants having the following depository designations:
Aspergillus niger AP 114 - III - 69 (CBS 320.81)
Aspergillus niger AP 114 - IV - 70 (CBS 321.81)
Aspergillus niger AP 114 - IV - 74 (CBS 322.81)
Aspergillus niger AP 114 - IV - 80 (CBS 323.81).

4,518,698

PLASMID AND PRODUCTION THEREOF

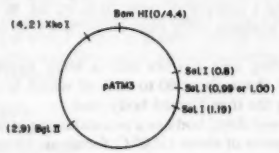
Masakazu Kikuchi, Toyono; Takaki Hayakawa, Osaka, and Makoto Kida, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 4, 1982, Ser. No. 385,053

Claims priority, application Japan, Oct. 6, 1981, 56-89942

Int. Cl.³ C12N *15/00, 1/00*

U.S. Cl. 435—317 **3 Claims**



1. An isolated plasmid pATM3, which is characterized by the following properties:

(1) Molecular weight: approximately 4.37±0.05 megadaltons,
(2) Shape: circular,
(3) Restriction endonuclease cleavage sites:
Bam HI (0/4.4), Sal I (0.8, 0.99 or 1.00, and 1.19), Bgl II (2.9) and Xho I (4.2),
(4) Sensitivity to restriction endonucleases:

Restriction endonuclease	Number of cleavage sites
Bam HI	1
Bgl II	1
Sal I	3
Sma I	>4
Xho I	1

4,518,699

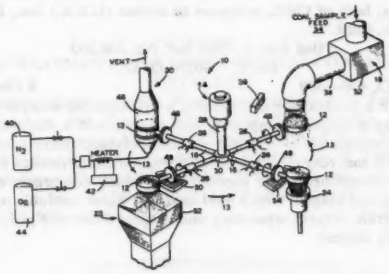
ON-LINE COAL ANALYZER

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 395,427, Jul. 6, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 532,878

Int. Cl.³ G01N *33/22, 35/02*

U.S. Cl. 436—49 **4 Claims**



1. A process for the on-line analysis of coal comprising the steps of rotating a sample cup of known volume around a centrally located drive means, filling said sample cup with a sample of pulverized coal at a first station, weighing said sample, using said weight and volume of said sample to calculate the bulk density of said sample, indexing said sample cup to a second station, performing at least one analysis step on the coal sample at said second station, monitoring the weight of said sample cup during said at least one analysis step to indicate complete drying of said sample when no more weight loss is detected, indexing said sample cup to a third station, dumping the residue of the coal sample at said third station, indexing said sample cup to a fourth station, cleaning said sample cup at said fourth station, and rotating said sample cup back to said first station.

4,518,700

METHOD AND APPARATUS FOR REGULATING THE TEMPERATURE OF AN ANALYTICAL INSTRUMENT REACTOR

Donald E. Stephens, Palo Alto, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

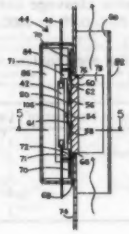
Filed Dec. 4, 1981, Ser. No. 327,378

Int. Cl.³ G01N *31/08*

U.S. Cl. 436—52 **4 Claims**

1. A reactor temperature regulator apparatus for an analytical instrument, said apparatus comprising:
a thermal mounting member;
means attached to said thermal mounting member for providing a flow path for a fluid stream;
solid state heat transfer means attached to said thermal

mounting member for heating and cooling said thermal mounting member; and



a heat sink block attached to said heat transfer means, the thermal capacitance of said heat sink block being at least seven times the thermal capacitance of said thermal mounting member.

4,518,701

REDUCTION IN NON-SPECIFIC INTERFERENCE IN HYDROPHOBIC LIGAND ASSAYS

Pyare L. Khanna, San Jose, and Floyd W. Colvin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 2, 1983, Ser. No. 500,503

Int. Cl.³ G01N *33/52*

U.S. Cl. 436—500 **8 Claims**

1. In a method for determining a hydrophobic analyte employing a reagent comprising said analyte and a fluorescent label conjugated to a water soluble polysaccharide carrier, wherein said reagent is subject to nonspecific interference from serum components, the improvement which comprises, contacting said reagent with a lipid modified water insoluble polysaccharide reagent separating said reagent from said polysaccharide reagent.

4,518,702

SILICON CARBIDE-BORON CARBIDE CARBONACEOUS BODY

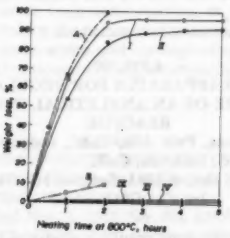
Hisayoshi Yoshida, Ogoori; Ichitaro Ogawa; Tsuyoshi Hagio, both of Tosu; Kazuo Kobayashi, Kurume, and Takayoshi Yamamoto, Iizuka, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,188

Claims priority, application Japan, Jan. 19, 1983, 58-6863; May 13, 1983, 58-83817

Int. Cl.³ C04B *35/56*

U.S. Cl. 501—90 **6 Claims**



1. A carbonaceous shaped body which is a sintered body of a powdery mixture comprising a powder of a low-temperature coke and a combination of powders of boron carbide and silicon carbide, the weight proportion of the boron carbide and the silicon carbide being in the range from 2:98 to 80:20 and the volume proportion of the coke powder to the combination of the powders of boron carbide and silicon carbide being in the range from 50:50 to 95:5.

4,518,703

CRYSTALLINE SILICA CATALYSTS

Dean A. Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 157,211, Jun. 9, 1980, Pat. No. 4,433,187, which is a division of Ser. No. 12,868, Feb. 16, 1979, Pat. No. 4,270,017. This application Dec. 6, 1982, Ser. No. 447,477

Int. Cl.³ B01J *21/06, 21/16, 27/00*

U.S. Cl. 502—63 **103 Claims**

29. A catalyst comprising a hydrogen activator comprising a member selected from the group consisting of chromium, copper, nickel and platinum, a crystalline silica polymorph having a pore volume of about 0.18 cc/gram, and an inorganic refractory oxide selected from the group consisting of alumina, silica, magnesia, beryllia and zirconia.

95. A catalyst comprising a microporous crystalline silica and a promoter containing a component selected from the group consisting of platinum, phosphorus, chromium, nickel, and copper.

96. A catalyst as defined in claim **95** wherein said catalyst further comprises an inorganic refractory oxide.

97. A catalyst as defined in claim **96** wherein said refractory oxide comprises alumina.

98. A catalyst as defined in claim **96** wherein said refractory oxide comprises silica.

4,518,704

ACTIVATED CARBON FORMED BODY AND METHOD OF PRODUCING THE SAME

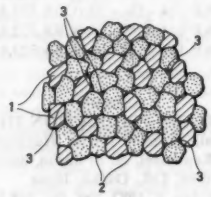
Yoshikatsu Okabayashi; Noboru Nakamura; Takeshi Matsumoto, and Yoshimasa Osumi, all of Kokubu, Japan, assignors to Kyoto Ceramic Kabushiki Kaisha, Japan

Continuation of Ser. No. 326,577, Dec. 12, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 545,074

Claims priority, application Japan, Dec. 8, 1980, 55-173500; Dec. 8, 1980, 55-173501

Int. Cl.³ B01J *20/20, 20/28, 21/18;* B32B *3/12*

U.S. Cl. 502—80 **8 Claims**



1. A method for producing a porous, fired, activated carbon formed body having a honeycombed structure about 60 to 70% of which is open space, comprising the steps of:

(a) forming a mixture of from 70 to 30 wt. % of activated carbon granules, with from 30 to 70 wt. % of a clay carrier;

(b) extruding said mixture into a body having a honeycombed shape about 60 to 70% of which is open space;

(c) drying the thus-formed body; and

(d) firing said dried body in a non-oxidizing atmosphere at a temperature of about 1100° C. for about 1 hour to about 4 hours thereby bonding the activated carbon granules with the clay carrier.

6. The porous, fired, activated carbon body according to claim **1** wherein said body defines about 300 to 600 cells per square inch.

8. A porous, fired, activated carbon formed body manufactured by the method according to claim 1.

4,518,705

THREE LAYER LAMINATE

Frank Solomon, Great Neck, N.Y., and Charles Grun, Matawan, N.J., assignors to Eltech Systems Corporation, Boca Raton, Fla.

Division of Ser. No. 202,577, Oct. 31, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,442
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ C25B 11/12
U.S. Cl. 502—101 10 Claims

1. A process for forming an electrode comprising adding a dilute aqueous dispersion of polytetrafluoroethylene particles to an aqueous suspension of larger active carbon particles to discontinuously coat said active carbon particles with smaller polytetrafluoroethylene particles; shear blending said discontinuously coated particles to form an intimate mix of active carbon particles and attenuated and fibrillated polytetrafluoroethylene; comminuting said intimate mix to yield a granular mix; forming said granular mix into an active sheet; and laminating the working surface of said active sheet to a current distributor and the opposite surface thereof to a polytetrafluoroethylene-containing wetproofing layer.

4,518,706

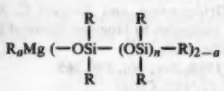
HYDROCARBON SOLUBLE CATALYST SUPPORTS AND RESULTANT POLYMERIZATION CATALYSTS

Donald E. Gessell, Ponca City, Okla., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 429,387, Sep. 30, 1982, abandoned. This application Aug. 18, 1983, Ser. No. 523,868
Int. Cl.³ C08F 4/62, 4/64, 4/68
U.S. Cl. 502—104 16 Claims

3. A method for preparing an olefin polymerization catalyst comprising

(a) contacting a hydrocarbon insoluble magnesium compound of the general formula



with sufficient aluminum alkoxide and/or organic ethers to render the magnesium compound hydrocarbon soluble, wherein the aluminum alkoxides have the general formula $Al(Q)_3$, wherein each Q can be OR^1 or R^1, but at least one Q must be OR^1, and wherein the aluminum alkoxide and/or organic ethers are present at levels of from about 0.05 moles per mole of magnesium to about 2 moles per mole of magnesium, based on the weight of the magnesium compounds present, and have the general formula R^2OR^3, wherein R^2 and R^3 can optionally have mutual covalent bonds to form cyclic ethers and wherein R, R^1, R^2, and R^3, are, independently, alkyl groups containing from 1 to 20 carbon atoms, aryl, aralkyl, and alkaryl groups, each containing from 6 to 20 carbon atoms, R can also be hydrogen or alkoxy groups containing from 1 to 20 carbon atoms, a is 0 or 1 and n is greater than 0, with

(b) non-halide transition metal alkoxides having at least one general formula

$$MO_g(OR^4)_r$$

$$R^4O[M(OR)_2O]_pR^4$$

$$R^4{}_xM(OR^4)_y$$

wherein M is titanium, vanadium, chromium or zirconium, each R^4 is, independently, alkyl groups containing from 1 to 20 carbon atoms, aryl groups, alkaryl groups, and aralkyl groups each containing from 6 to 20 carbon atoms, g is 0 or 1, r is 2 to 4, and $2g+r$ is equal to the valence of M; p is at least 2; and $x+y$ is equal to the valence of M to yield a magnesium to titanium ratio of at least 1:1, then

(c) reacting the mixture of (a) and (b) with a halogenating agent to obtain a polymerization catalyst having a halogen to magnesium ratio of at least 2.0.

4,518,707

PROCESS FOR PREPARING HIGH SURFACE AREA IRON/COBALT FISCHER-TROPSCH SLURRY CATALYSTS

Stuart L. Soled, Madison, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,190
Int. Cl.³ B01J 23/78, 27/22
U.S. Cl. 502—174 32 Claims

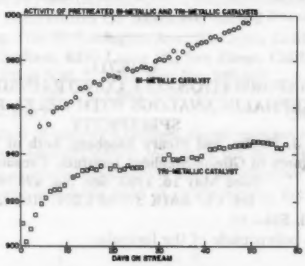
1. A composition of matter comprising an unsupported, Group IA or IIA metal salt promoted iron-cobalt spinel, or mixture thereof, said spinel exhibiting a single phase powder X-ray diffraction pattern substantially isostructural with Fe_3O_4, and possessing a BET surface area greater than 5 m^2/g and an iron-cobalt atomic ratio of 4 to 1 or above.

4,518,708

PRETREATMENT OF A FRESH IRIDIUM-CONTAINING CATALYST

Sowmithri Krishnamurthy, West Deptford; George R. Landolt, Audubon, and Hans J. Schoennagel, Lawrenceville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 385,158, Jun. 4, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 586,640
Int. Cl.³ B01J 27/10, 27/08, 23/46, 27/32
U.S. Cl. 502—230 11 Claims



1. In a method of preparing a fresh metal-containing reforming catalyst wherein a porous support is impregnated with an iridium compound in combination with other metals and thereafter dried, the improvement comprising increasing the dispersion of metals on said porous support prior to exposure to a reducing atmosphere by pretreating the catalyst with oxygen, dry hydrogen halide and a reducing agent in the following sequence of steps:

(1) contacting the catalyst with an oxygen-containing gas at temperatures of about 850–1000° F. with oxygen concentration of about 0.1–50 wt. % for about 0.1 to 24 hours.

(2) contacting the catalyst with dry hydrogen halide at temperatures ranging from about 700–1000° F. for about 0.5 to 24 hours utilizing at least 0.1 wt. % hydrogen halide per weight of catalyst per hour; and

(3) contacting the catalyst with a reducing agent at temperatures ranging from 400–1000° F. for a period of time ranging from 0.1 to 24 hours

whereby said dispersion of metals is such that at least 50% of the total metal is exposed as surface metal after pretreatment.

5. The process of claim 1 wherein said hydrogen halide treatment step comprises treating said catalyst with about 1.5% by weight of hydrogen chloride per weight of said catalyst per hour for about 2 hours at a temperature of from about 850–950° F.

6. The process of claim 5 wherein the hydrogen chloride is in admixture with an inert gas.

4,518,709

DUAL PARTICLE HYDROTREATING CATALYST

Regis J. Pellet, Tarrytown, N.Y., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 238,936, Feb. 27, 1981, Pat. No. 4,353,791. This application Apr. 5, 1982, Ser. No. 365,236

Int. Cl.³ B01J *23/24, 23/26, 23/28, 23/30*

U.S. Cl. 502—254 **9 Claims**

1. A hydrotreating catalyst composition comprising particles of Component A consisting essentially of at least one Group VIB metal component supported on refractory inorganic oxide and particles of Component B consisting essentially of either cobalt and/or nickel component supported on refractory inorganic oxide.

4,518,710

CATALYST FOR THE REDUCTION OF NITROGEN OXIDES IN GASEOUS MIXTURES AND METHOD OF MAKING THE CATALYST

John F. Brennan, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 25, 1984, Ser. No. 573,753

Int. Cl.³ B01J *21/06, 23/22, 23/30*

U.S. Cl. 502—309 **15 Claims**

1. A catalyst composition useful for the reduction of nitrogen oxide comprising an inorganic oxide support having tungsten and vanadium deposited thereon, said support having been treated, before or after the deposition of either of said tungsten or vanadium thereon, with a strong mineral acid, excluding sulfuric and phosphoric acids.

4,518,711

CONFORMATIONALLY CONSTRAINED CYCLIC ENKEPHALIN ANALOGS WITH DELTA RECEPTOR SPECIFICITY

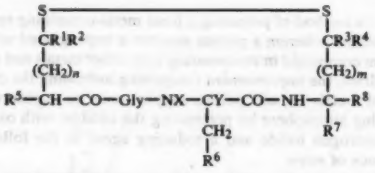
Victor J. Hruby, and Henry Mosberg, both of Tucson, Ariz., assignors to Gibson-Stephens Institute, Tucson, Ariz.

Filed May 16, 1983, Ser. No. 494,982

Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—11 **26 Claims**

1. A polypeptide of the formula:



wherein

R^1 and R^2, which may be the same or different, are hydrogen, methyl, or a lower alkyl group having five or less carbon atoms;

R^3 and R^4, which may be the same or different, are hydrogen, methyl, or lower alkyl groups having five or less carbon atoms, provided, however, that R^1 and R^2, R^3 and R^4 may not all be hydrogen;

R^5 is hydrogen, L-tyrosine, D-tyrosine, or L-tyrosine or D-tyrosine substituted on the N^{α}-amino with 1 or 2 lower alkyl or alkenyl groups;

R^6 is a substituted or unsubstituted aromatic radical;

RHU 7 is hydrogen or methyl;

R^8 is carboxylate, carboxamide or amino acid residue;

X and Y are hydrogen or methyl; and

n and m, which may be the same or different, are 0 or 1.

4,518,712

PIPERAZINE DERIVATIVE AND ANALGESIC COMPOSITION CONTAINING THE SAME

Hajime Fujimura, Kyoto; Yasuzo Hiramatsu, Otsu; Tomio Yamazaki, Tokushima; Shozo Yamada, Tokushima, and Takaji Honna, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 275,690

Claims priority, application Japan, Jun. 30, 1980, 55-89782; May 8, 1981, 56-69689

Int. Cl.³ A01N *43/48*

U.S. Cl. 514—255 **20 Claims**

1. A piperazine compound having the formula (I),

(I)

wherein R_1 represents cyclopropylmethyl, isopropyl, or allyl and R_2 represents phenyl substituted by one or two halogen atoms and/or one trifluoromethyl group, or pharmaceutically acceptable salts thereof.

18. A method of producing an analgesic effect in a patient in need of such effect, said method comprising administering to said patent an effective amount of a compound of claim 1.

4,518,713

ANALGESIC SUBSTITUTED-1-AMINOALKYLAMINO-4-ARYLOXYPIPERIDINES

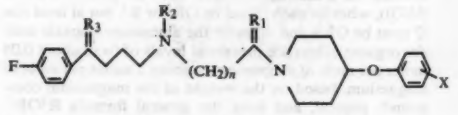
Raymond W. Kosley, Jr., Bridgewater, and Richard C. Allen, Flemington, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 13, 1984, Ser. No. 600,265

Int. Cl.³ A61K *31/445;* **C07D** *211/46*

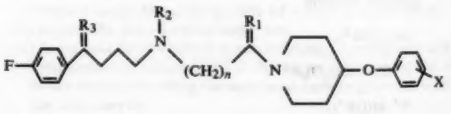
U.S. Cl. 514—326 **114 Claims**

1. A compound of the formula



where X is hydrogen, loweralkyl, CF_3, acetyl or halogen; n is 1 or 2; R_1 is H_2 or oxygen; R_2 is H, loweralkyl or benzyl; and R_3 is oxygen or $—OCH_2CH_2O—$, or a pharmaceutically acceptable acid addition salt thereof.

114. An analgesic composition which comprises an effective pain alleviating amount of a compound of the formula



where X is hydrogen, loweralkyl, CF_3, acetyl or halogen; n is 1 or 2; R_1 is H_2 or oxygen; R_2 is H, loweralkyl or benzyl; and

R_3 is oxygen or $-OCH_2CH_2O-$ or a pharmaceutically acceptable acid addition salt thereof.

4,518,714

PROCESS FOR THE SELECTIVE PRODUCTION OF OLEFINS FROM SYNTHESIS GAS

Bruce L. Gustafson, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 499,002, May 27, 1983,. This application Jul. 11, 1984, Ser. No. 629,870

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—721 **11 Claims**

1. In a process for the selective production of α-olefins by the reaction at elevated temperature and pressure of a mixture of gases comprising carbon monoxide and hydrogen, the improvement which comprises the use of a catalyst system comprising palladium, iron, and zinc, wherein the amount of palladium and iron present in the catalyst is about 0.1 to 10% by weight.

4,518,715

PROCESS FOR PRODUCING ETHYLENE GLYCOL USING A RUTHENIUM-COPPER CATALYST

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 22, 1984, Ser. No. 592,316

Int. Cl.³ C07C *27/06*

U.S. Cl. 518—700 **14 Claims**

1. The process for making ethylene glycol and its monoalkyl derivatives which comprises the steps of contacting a mixture of CO and H_2 with a bimetallic catalyst system comprising a ruthenium-containing compound plus a copper or silver-containing compound dispersed in a low-melting quaternary phosphonium salt and heating said mixture at a temperature of at least 180° C. under a moderate pressure of greater than 35 atm with sufficient carbon monoxide and hydrogen to satisfy the above-noted stoichiometry of the desired ethylene glycol synthesis for a sufficient time to provide said ethylene glycol.

4,518,716

FOAMABLE ORGANOSILOXANE COMPOSITIONS

Chi-Long Lee, Brookfield, and James A. Rabe, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 665,272

Int. Cl.³ C08J *9/08, 9/12, 9/14*

U.S. Cl. 521—82 **26 Claims**

1. A foamable polyorganosiloxane composition exhibiting a viscosity of from 0.5 to 500 Pa.s at 25° C. in the absence of a blowing agent, where said composition is stable during storage under substantially anhydrous conditions and superatmospheric pressure, and in the presence of atmospheric pressure and moisture yields a cured, closed cell polyorganosiloxane foam exhibiting a cell size of up to 4 mm. and a minimum cell concentration of 4 per linear centimeter, said composition comprising the product obtained by mixing in the absence of atmospheric moisture.

(A) A room temperature vulcanizable elastomeric composition comprising the moisture curable product obtained by mixing

(1) an organosiloxane polymer curable in the presence of a moisture reactive crosslinker and selected from the group consisting of polydimethylsiloxanes and graft copolymers containing at least 20 mole percent of dimethylsiloxane units, any remaining units being derived from substantially linear addition type organic polymers, and

(2) an amount of a crosslinker sufficient to cure

(1) in the presence of atmospheric moisture,

(B) A foam stabilizer in an amount sufficient to stabilize said foam during the curing process, where (B) consists essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$ $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R' is an alkyl radical containing from 1 to 3 carbon atoms, and R" is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said flourine-containing units by a sequence of at least two methylene units or by an oxygen atom that is in turn bonded to a sequence of at least two methylene units, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less wtih proviso that when R and R" represent fluorine-containing units bonded to silicon via and oxygen atom the organosiloxane copolymer optionally contains repeating untis of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxly group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to (a) impart a surface tension of less than $2.2\times10-^4$ newtons per centimeter at 25° C. to 10 percent by weight solution of (B) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa.s at 25° C. and (b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity;

(C) a blowing agent in an amount sufficient to convert said polyorganosiloxane composition to a foam under atmospheric pressure and at a temperature of 25° C.

4,518,717

LOW DENSITY, MODIFIED POLYIMIDE FOAMS AND METHODS OF MAKING SAME

John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021, and John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120

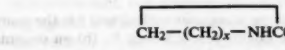
Filed Nov. 7, 1983, Ser. No. 549,618

Int. Cl.³ C08J *9/02, 9/12*

U.S. Cl. 521—109.1 **38 Claims**

1. The method of making a resilient, flame resistant modified polyimide foam product which comprises the steps of:

reacting an aromatic dianhydride with an effective amount of an oxime in a mole ratio of oxime having the general formula:



wherein "x" is an integer from 1 to 5, to dianhydride up to about 1.5:1 to produce an N-substituted aliphatic imide;

dissolving said imide in a reactive solvent esterifying agent to exterify said imide;

adding thereto a diamine;

drying the resulting solution to produce a powdered, prepolymer;

blending with said powdered prepolymer from about 0.05 to 10 wt.%, based on prepolymer weight, of a hydrated compound which is stable up to at least about 100° C.; and

heating the dry material to a selected foaming temperature of from about 120° C. to about 320° C. for a period of from about 10 to about 60 minutes;

whereby a low density, resilient foam product having good flame resistance is produced comprising polyimide and polyimide-amide with proportions depending on the selected foaming temperature.

4,518,718

RIGID ZEOLITE CONTAINING POLYURETHANE FOAMS

Charles B. Frost, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 18, 1984, Ser. No. 611,772
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—122 16 Claims

1. A process for the preparation of a closed cell rigid polyurethane foam by mixing intimately a polyol component with an isocyanate component and curing the resulting mixture, comprising:

(a) dispersing into each component finely divided zeolite capable of sorbing molecules with effective critical diameters of up to about 10 Å, said zeolite constituting up to about 60% of the final foam weight; and

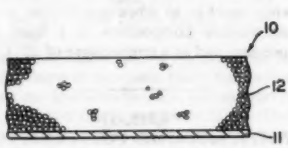
(b) adding a blowing agent to each component before combining said components.

4,518,719

METAL CATALYZED PREPARATION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 585,703, Mar. 2, 1984, which is a division of Ser. No. 319,868, Nov. 9, 1981, Pat. No. 4,438,018, which is a continuation of Ser. No. 113,841, Jan. 21, 1980, abandoned. This application Sep. 10, 1984, Ser. No. 649,042
Int. Cl.[3] C08J *9/14*
U.S. Cl. 521—136 19 Claims



1. A foam material comprising the reaction product of:

A. phenol aldehyde resin forming reactants,

B. a blowing agent, and

C. a surfactant which is the product of a free radical addition polymerization of a cyclic nitrogenous vinyl monomer and an esterified unsaturated dibasic acid in the presence of (a) a polyoxyalkylene adduct having the formula

H (polyoxyalkylene chain)$_t$ R,

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, (b) an organic or inorganic per-compound, and (c) a metal catalyst selected from the group consisting of ferrocene, acetylferrocene, benzoylferrocene, cobaltocene, 1,1'-diacetylferrocene, 1,1'- ferrocenebis-(diphenyl-phosphine), nickelocene, hafnocene dichloride, ferrocenecarboxaldehyde, mixtures of said ferrocene compounds and other transition metal compounds containing a metal having an atomic number of 21 to 30, and a mixture of compounds selected from the group consisting of iron (II) sulfate and iron (III) sulfate, iron (II) sulfate and iron (III) chloride, maganese (II) acetylacetonate and manganese (III) acetylacetonate, cobalt (II) benzoate and cobalt (III) acetylacetonate, copper (I) acetate and cooper (II) acetylacetonate, and vanadium (III) acetylacetonate and vanadium (IV) oxide acetylacetonate, said polyoxyalkylene adduct optionally being treated either before or after said polymerization with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50, and the major component of said surfactant comprising the product formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct.

4,518,720

FLEXIBLE POLYURETHANE FOAMS MADE FROM POLYETHER POLYOLS MODIFIED WITH EPOXY RESIN-DIAMINE ADDUCTS

Michael Cuscurida; Harold G. Waddill, and Bruce W. Peterson, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,434
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—156 13 Claims

1. Flexible polyurethane foam being produced by the process comprising

reacting a modified polyether polyol together with an organic polyisocyanate in the presence of a polyurethane catalyst and a blowing agent, wherein the modified polyether polyol is produced by the process comprising adding an epoxy resin-diamine adduct to a polyether polyol during the reaction of an alkylene oxide with a polyol initiator where the mole ratio of epoxy equivalents to amine equivalents in the epoxy resin-diamine adduct is in the range of about 2/1 to about 10/1.

4,518,721

HYDROPHILIC DENTURE ADHESIVE

Dadi J. Dhabhar, Norwalk, and Nicholas F. Schmidt, Brookfield, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Continuation of Ser. No. 361,631, Mar. 26, 1982, , which is a continuation-in-part of Ser. No. 258,562, Apr. 29, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,751
Int. Cl.[3] C08L *1/26;* A61K *9/00;* C09K *3/00*
U.S. Cl. 523—120 19 Claims

1. A denture adhesive composition consisting essentially of a substantially anhydrous mixture of:

(a) from about 15 to about 55 percent w/w sodium carboxymethylcellulose and poly(ethylene oxide) homopolymer in a weight ratio of from about 6:1 to about 1:6, respectively; and

(b) from about 45 to about 85 percent w/w of a polyethylene glycol fraction comprising one or more polyethylene glycols each having a number average molecular weight of from 200 to 20,000 and said fraction having a viscosity of from about 44 to about 25,600 centipoises at about 60° C.

4,518,722

DIFFUSELY REFLECTING PAINTS INCLUDING POLYTETRAFLUOROETHYLENE AND METHOD OF MANUFACTURE

John B. Schutt, Silver Spring, and Michael C. Shai, Gambrills, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 26, 1984, Ser. No. 604,337
Int. Cl.[3] C08L *27/18*
U.S. Cl. 523—135 18 Claims

1. A diffuse, reflective paint composition comprising a self-polymerizing, alcohol soluble silicone-based paint binder, granule sized TFE pigment and a liquid alcohol.

4,518,723

CURABLE EPOXY RESIN COMPOSITIONS AND USE IN PREPARING FORMED, SHAPED, FILLED BODIES

Wayne D. Woodson, Danville, Ill., assignor to CL Industries, Inc., Danville, Ill.

Continuation-in-part of Ser. No. 405,420, Aug. 5, 1982, abandoned. This application Oct. 22, 1982, Ser. No. 436,031

Int. Cl.[3] C08K *3/36;* C08L *63/00*

U.S. Cl. 523—466 30 Claims

1. A curable epoxy resin composition comprising a mixture of an acid curable epoxy resin and from about 15 to 50% based on the weight of the resin of an oxidizing agent capable of reacting with sulfur dioxide to form a catalyst for curing said epoxy resin.

4,518,724

AQUEOUS COATING COMPOSITION

Teruaki Kuwajima; Katsuaki Kida, both of Osaka, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 3, 1983, Ser. No. 538,651

Claims priority, application Japan, Oct. 4, 1982, 57-174890; Dec. 8, 1982, 57-216200; Jan. 25, 1983, 58-10875; Jan. 25, 1983, 58-10876; Jan. 29, 1983, 58-13205; Jan. 29, 1983, 58-13206

Int. Cl.[3] C09D *5/02, 3/66, 3/80, 3/81*

U.S. Cl. 523—501 30 Claims

1. An aqueous coating composition comprising:

(A) at least one aqueous resin selected from the group consisting of alkyd resin, polyester resin, acryl resin, acryl-modified alkyl resin and acryl-modified polyester resin and

(B) at least one component selected from water-insoluble resinous particles obtained by the polymerization of at least one ethylenically unsaturated compound, the average grain diameter of said particles being 0.3 to 6μ, the solid weight ratio of said (A) to (B) being 99:1 to 15:85.

4,518,725

FLUIDIZING AGENTS FOR HYDRAULIC BONDING MATERIALS; HYDRAULIC BONDING MATERIALS CONTAINING SAID FLUIDIZING AGENTS; METHOD OF MAKING AND USING SAME

Jean P. Guicquero, Labarte sur Leze, France, assignor to Chryso S.A., Toulouse, France

Filed Jul. 27, 1983, Ser. No. 517,622

Claims priority, application European Pat. Off., Jul. 28, 1982, 82401401.3

Int. Cl.[3] C04B *13/28;* C08G *12/08*

U.S. Cl. 524—3 31 Claims

1. A method of synthesizing a fluidizing agent for hydraulic bonding materials in a single step which comprises reacting in aqueous solution:

(1) an aminosulfonic acid having at least one aromatic nucleus;

(2) a nitrogenous compound having at least two NH_2 functions; and

(3) formaldehyde or compounds which generate formaldehyde under reaction conditions;

at a temperature ranging from about 40° C. to about 115° C. for about one hour, so as to result in the condensation thereof, to form a condensation product capable of functioning as a fluidizing agent for hydraulic bonding materials.

4,518,726

METALLIC BASE PAINT

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1982, Ser. No. 365,937

Claims priority, application Japan, Apr. 27, 1981, 56-64780

Int. Cl.[3] C09D *3/12, 3/82;* C08L *83/06*

U.S. Cl. 524—32 11 Claims

1. An ambient temperature, moisture curable coating composition consisting essentially of a wet solution blend of (A) a silyl group containing vinyl type resin having a backbone substantially comprising a polyvinyl type polymer chain and containing at least one silicon atom attached to a hydrolyzable group at a terminal or in a side chain in its molecule; and (B) a metallic powder; and one or more of the following: (C) acrylic resin; (D) cellulosic compound; and (E) reactive silicon compound, wherein said metallic powder is suspended in said wet solution blend.

4,518,727

WATER BASED RESIN EMULSIONS

Frank J. Traver, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 229,247, Jan. 28, 1981, abandoned. This application Apr. 30, 1984, Ser. No. 604,607

Int. Cl.[3] C08L *1/00, 1/24*

U.S. Cl. 524—35 18 Claims

1. A water based silicone resin emulsion consisting essentially of:

(a) 100 parts by weight of at least one organopolysiloxane resin composition consisting essentially of zero to 50 percent by weight monofunctional units of the formula $R_3SiO_{0.5}$, zero to 60 percent by weight difunctional units of the formula R_2SiO, zero to 100 percent by weight of trifunctional units of the formula $RSiO_{1.5}$, and zero to 60 percent by weight tetrafunctional units of the formula SiO_2, wherein at least ten mole percent of the units are trifunctional units, tetrafunctional units or a mixture thereof, wherein R is a substituted or unsubstituted monovalent hydrocarbon radical and wherein said organopolysiloxane resin has an R to Si ratio of, approximately, 1.0 to 1.99 R groups for each silicon atom;

(b) 0.25 to 4.0 parts by weight of a combination of emulsifying agents per 100 parts of said organopolysiloxane resin wherein said emulsifying agent combination consists essentially of 5 to 95 percent by weight of a cellulosic emulsification agent and 5 to 95 percent by weight of an anionic surfactant, and wherein said combination of emulsifying agents is effective for dispersing said organopolysiloxane resin in a water based emulsion; and

(c) 25 to 500 parts by weight water.

4,518,728

CARBON BLACK FILLED NYLONS MODIFIED FOR IMPROVED TOUGHNESS

Robert E. Pollard, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 4, 1984, Ser. No. 596,795

Int. Cl.[3] C08K *5/16*

U.S. Cl. 524—88 16 Claims

1. A molding composition comprising: (1) a polyamide resin; (2) a maximum of 10 percent by weight and a minimum of 0.05 percent by weight of the composition of carbon black; and (3) a maximum of about 200 percent by weight and a minimum of 0.25 percent by weight of the carbon black of a copper phthalocyanine pigment.

4,518,729

SOLUTIONS OF ISOCYANATO-ISOCYANURATES IN PLASTICIZERS FOR POLYVINYL CHLORIDE, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS ADHESION-IMPROVING ADDITIVES IN COATING COMPOSITIONS BASED ON PLASTICIZED POLYVINYL CHLORIDE

Peter Breidenbach, Cologne; Helmut Hurnik, Leverkusen, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

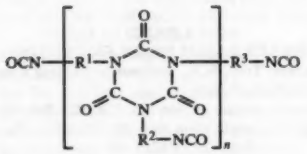
Filed Oct. 22, 1981, Ser. No. 313,842

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041732

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—101 **5 Claims**

1. A solution of isocyanato-isocyanurates in a plasticizer for polyvinyl chloride, characterized by a content of from about 1 to 50% by weight of compounds corresponding to the following idealized formula:



in which

R^1, R^2 and R^3 are the same or different and represent (i) difunctional aromatic hydrocarbon radicals of the type obtained by removing the isocyanate groups from 2,4-and/or 2,6-diisocyanato-toluene or (ii) difunctional aromatic hydrocarbon radicals of the type obtained by removing the isocyanate groups from 2,2'-, 2,4'- and/or 4,4'-diisocyanato-diphenyl methane, with the proviso that at least about 25 mole percent and at most about 83 mole percent of the radicals correspond to definition (i), and

n is an integer or a fraction (as a statistical average) of from about 1 to 10.

4,518,730

TRANSPARENT ANTIREFLECTION VARNISH FOR GLASS SUPPORTS, AND RELATED VARNISHING METHOD FOR GLASS VIDEO SCREENS

Giancarlo Gastaldo, Vestignè, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Jan. 20, 1983, Ser. No. 459,656

Claims priority, application Italy, Jan. 22, 1982, 67062 A/82

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—114 **8 Claims**

1. A transparent, antireflection varnish for a glass support comprising a plasticising acrylic resin, a diluent, a matting component, and an epoxy silane, wherein said epoxy silane is gamma-glycidoxpropyltrimethoxysilane present in an amount in the range of 15 to 20% by weight of the varnish and an amino silane catalyst is added to the varnish at the time of use to cause polymerization and hardening of the varnish, and wherein said acrylic resin is present in an amount in the range of 40 to 45% by weight of the varnish and said matting component is a polypropylene wax present in an amount in the range of 0.1 to 1% by weight of the varnish.

4,518,731

PROCESS FOR THE CRYSTALLIZATION OF HIGH POLYMERS IN THE PRESENCE OF NUCLEANT SYSTEMS BASED ON ZEO LITES

Valentino Zamboni; Corrado Brichta, and Claudio Troglia, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 22, 1983, Ser. No. 564,187

Claims priority, application Italy, Dec. 24, 1982, 24978 A/82

Int. Cl.³ C08K *5/42*

U.S. Cl. 524—166 **9 Claims**

1. An adduct obtained by the interaction of:

(a) an aryl-carboxylic or sulphonic acid, selected from those which, in the form of metal salts, characteristically exert a nucleating effect on crystalline polymers of the alpha-olefins, said acid having a melt point greater than the crystallization temperature of the polymer and being thermally stable at the maximum operating temperature in the processing of the polymeric material and

(b) a crystalline aluminum silicate of an alkaline or earth-alkaline metal of zeolitic tectosilicate, having a pore diameter comprised between 3 Å and 13 Å and a molar ratio SiO_2/Al_2O_3 comprised between 2 and 5, in a powdery form, under such conditions that will allow to obtain a chemio adsorption of acid (a) in component (b), the adduct being characterized in that acid (a) is present in quantities comprised between 1 and 25 grams per 100 g of component (b), and that it is partly bound to component (b) by chemical bonds of a polar type, said adduct being further characterized in that it is a nucleating agent for crystalline polymers and copolymers of alpha-olefins, thermoplastic polyesters and polyamides.

4,518,732

SOLID STABILIZER COMPOSITION

Jürgen Büssing, Bensheim, and Hubert Müller, Dieburg, both of Fed. Rep. of Germany, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 544,920, Oct. 24, 1983, abandoned, which is a continuation of Ser. No. 389,642, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 304,522, Sep. 21, 1981, abandoned, which is a continuation of Ser. No. 182,549, Aug. 29, 1980, abandoned, which is a continuation of Ser. No. 37,593, May 9, 1979, abandoned. This application May 18, 1984, Ser. No. 611,914

Claims priority, application Switzerland, May 19, 1978, 5463/78

Int. Cl.³ C08K *5/00;* **C08L** *91/06*

U.S. Cl. 524—178 **4 Claims**

1. A dry pourable solid composition, suitable for stabilizing a halogen-containing polymer, consisting essentially of

(a) about 16.7 to about 50% by weight of the total composition of a liquid sulfur-containing organotin stabilizer or mixtures thereof, in intimate admixture with

(b) about 83.3 to about 50% by weight of the total composition of a solid lubricant, having a melting point of 50°–120° C., selected from the group consisting of paraffin wax, montan wax, oxidized paraffin wax, oxidized polyethylene wax, oxidized and partially saponified polyethylene wax and mixtures thereof.

4,518,733

RUBBER COMPOSITIONS COMPRISING (1) POLYISOPRENE (2) COBALT SALT OF ROSIN (3) CARBON BLACK AND (4) SULPHUR

Yasuhiro Ishikawa, Yokohama; Kazuhiro Yamada, Isehara, and Masashi Kida, Chigasaki, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 440,057, Nov. 8, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,313
Claims priority, application Japan, Nov. 24, 1981, 56-186844
Int. Cl.³ C08K 3/04
U.S. Cl. 524—274 4 Claims

1. A rubber composition for tires consisting essentially of, by weight, 100 parts of synthetic polyisoprene rubber, 0.02–0.8 parts of a cobalt salt of rosin, calculated as elemental cobalt, 60–100 parts of carbon black having iodine adsorbability of 70–130 mg/g and dibutyl phthalate adsorbability of 50–80 ml/100 g, and 4.5–10 parts of sulfur.

4,518,734

WATER BASED AEROSOL COATINGS

Bruce R. Brouillette, Sauk Village, and Martha J. Shafer, Chicago, both of Ill., assignors to Rust-Oleum Corporation, Vernon Hills, Ill.

Filed Jun. 22, 1981, Ser. No. 275,929
Int. Cl.³ C09D 5/02, 3/64; C08K 5/06
U.S. Cl. 524—378 5 Claims

1. A water containing aerosol coating containing the following ingredients in the percentage by weight amounts indicated:

a. water soluble resin	10.0–30.0
b. water soluble solvent	0.5–20.0
c. water	20.0–60.0
d. dimethylether	20.0–40.0.

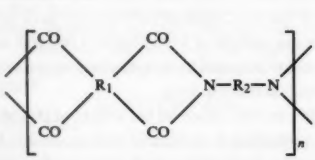
4,518,735

HIGH TEMPERATURE STABLE ADHESIVE FOR SEMICONDUCTOR DEVICE PACKAGES, LOW-COST SEMICONDUCTOR DEVICE PACKAGE AND PROCESS

Gary B. Goodrich, and Jadish G. Belani, both of Cupertino, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 29, 1981, Ser. No. 316,310
Int. Cl.³ C08K 3/08
U.S. Cl. 524—403 4 Claims

1. A composition for attaching a semiconductor die to a substrate, which comprises a crosslinkable resinous polyimide precursor which will cure to give polyamide having a recurring unit of the formula:



in which R_1 and R_2 are radicals of a tetravalent aromatic group and a divalent aromatic group, respectively, and n is a positive integer, a sufficient amount of an alkylaminotrialkoxysilane crosslinking agent to cure said resinous polyimide precursor, a sufficient amount of a finely divided conductive metal to render said composition conductive in the cured state and a polar organic solvent for said polyimide precursor and alkylaminotrialkoxysilane crosslinking agent.

4,518,736

BORON NITRIDE PAINT FOR CERAMIC HOT PRESSING

Paul F. Jahn, Wixom, Mich., assignor to Advanced Ceramic Systems, Inc., Livonia, Mich.

Filed Apr. 6, 1984, Ser. No. 597,670
Int. Cl.³ C08K 3/38, 5/05
U.S. Cl. 524—404 5 Claims

1. A paint for ceramic hot pressing comprising; boron nitride powder; an acrylic paint; and a volatizable liquid, having the following composition in parts by weight:
boron nitride powder: 50–100
acrylic paint: 25–75
volatizable liquid: 100–200.

4,518,737

DIELECTRIC MATERIAL AND METHOD OF MAKING THE DIELECTRIC MATERIAL

G. Robert Traut, South Killingly, Conn., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 213,837, Dec. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 972,995, Dec. 26, 1978,. This application Feb. 17, 1982, Ser. No. 349,466
Int. Cl.³ C08K 3/10
U.S. Cl. 524—413 8 Claims

1. A non-porous dielectric sheet material wherein the dielectric constant is substantially isotropic, said sheet material comprising a fluorinated polymer binding selected from the group consisting of polytetrafluoroethylene, fluorinated poly (ethene-co-propene), polyolefins, polyacrylates, polystyrenes and poly (vinylidene fluoride), a ceramic filler in particulate form having an average particle diameter of between about 1 to 20 micrometers and non-conductive inorganic microfibers having an average diameter less than 2 micrometers selected from the group consisting of glass, aluminum silicate, potassium titanate, quartz and zirconia, the ratio of the weight of fibers to total non-filler being in the range of 0.07 to 0.20 and the filler comprising between 10% and 75% by weight of the dielectric material.

4,518,738

POWDER FOR USE IN DRY SENSITIZATION FOR ELECTROLESS PLATING

Gunnar Sorensen, Risskov, and Leo Svendsen, Aarhus, both of Denmark, assignors to NESELCO, Copenhagen, Denmark

PCT No. PCT/DK81/00087, § 371 Date Jun. 4, 1982, § 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01382, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 9, 1981, Ser. No. 387,887
Claims priority, application Denmark, Oct. 10, 1980, 4277/80
Int. Cl.³ C08K 3/10
U.S. Cl. 524—435 3 Claims

1. A powder for use in dry sensitization for electroless plating, comprising a plastics base material comprising a mixture of (a) a plastics material selected from the group consisting of:
ester of hydrogenated rosin,
esterified maleic resin, and
styrene-acrylic copolymer,
and (b) a plastics material selected from the group consisting of:
polybutadiene,
polymethacrylate,
polyvinyl chloride, and
polyhydroxymethacrylate,
to which has been added sensitizing particles comprising iron or tin compounds in an amount effective to achieve said sensitization.

4,518,739

Patent Not Issued For This Number

4,518,740

MOISTURE-HARDENING VARNISHES WITH AN ISOCYANATE RESIN BASE

Josef Disteldorf, Herne, and Werner Flakus, Recklinghausen, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellshcaft, Marl, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,643

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322723

Int. Cl.³ C08K *3/22*

U.S. Cl. 524—783 **8 Claims**

1. Moisture-hardening varnishes which comprise adducts of a mixture of diisocyanates, wherein said diisocyanate mixture comprise about 88 to 99% by weight of 2-methyl-1,5-diisocyanato-pentane, and about 12 to 1% by weight of 2-ethyl-1,4-diisocyanatobutane.

4,518,741

CHEMICALLY MODIFIED ASPHALTS AND GLASS FIBERS TREATED THEREWITH

William E. Uffner, Newark, and Robert N. White, Etna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 407,390, Aug. 12, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,556

Int. Cl.³ C08F *289/00;* **C08G** *83/00;* **C08H** *5/00*

U.S. Cl. 525—54.5 **5 Claims**

1. In a composition which is a reaction product of paving grade asphalt, a vinyl aromatic monomer and a rubbery polymer, the improved composition wherein said rubbery polymer is a thermoplastic rubber, generally linear block coplanar of styrene and butadiene having polystyrene end blocks and a polybutadiene midblock and wherein said improved composition has an increased elastic recovery rate, has increased viscosity stability, is less tacky and has a lower viscosity and improved glass fiber bundle impregnant qualities.

4,518,742

THERMOPLASTIC RESIN COMPOSITION HAVING TOUGHNESS AND HIGH HEAT DISTORTION RESISTANCE

Eiichi Muramatsu, Himeji; Shigemi Matsumoto, Takasago, and Fumiya Nagoshi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1983, Ser. No. 546,596

Claims priority, application Japan, Nov. 1, 1982, 57-192198

Int. Cl.³ C08L *69/00, 51/00*

U.S. Cl. 525—67 **3 Claims**

1. A composition comprising (I) a thermoplastic resin and (II) an aromatic polycarbonate in a (I)/(II) ratio of 90/10 to 40/60 by weight, said resin (I) being prepared by polymerizing 95 to 70 parts by weight of monomers in the presence of 5 to 30 parts by weight of diene rubber by a process which comprises polymerizing 2 to 40 parts by weight of (A) a monomer mixture containing at least 70% by weight of acrylonitrile and styrene in an acrylonitrile/styrene ratio of 10/90 to 40/60 by weight in the presence of the diene rubber, adding 50 to 90 parts by weight of (B) α-methylstyrene or a monomer mixture containing at least 80% by weight of α-methylstyrene to the polymerization system, and gradually adding (C) acrylonitrile or a monomer mixture containing at least 70% by weight of acrylonitrile to the system, while carrying out the polymerization, the ratio of the total weight of α-methylstyrene contained in the monomers (B) and (C) to the total weight of acrylonitrile contained in the monomers (B) and (C) being from 90/10 to 65/35.

4,518,743

MOULDING COMPOSITIONS OF VINYL CHLORIDE POLYMERS, CERTAIN COPOLYMERS AND POLYMERIC PLASTICISERS HAVING A HIGH RESISTANCE TO AGEING

Christian Lindner, Cologne; Karl-Heinz Ott; Walter Uerdingen, both of Leverkusen; Hans-Eberhard Braese, Cologne, and Helmut Hurnik, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,634

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229131

Int. Cl.³ C08L *27/06, 31/04, 32/20, 55/02*

U.S. Cl. 525—80 **6 Claims**

1. A thermoplastic molding composition comprising (A), (B), (C), (D) and (E) wherein:

(A) is from 25 to 50 parts, by weight of molding composition, of a vinyl chloride homo- or co-polymer;

(B) is from 25 to 50 parts, by weight of the molding composition, of an ABS-graft product comprising

from 30% to 95%, based on the weight of (B), of a monomer mixture of a styrene, methyl methacrylate, α-methyl styrene or combinations thereof, and (b) acrylonitrile, in weight ratio of (a) to (b) of from 90:10 to 60:40; and

from 70% to 5%, based on the weight of (B), of a butadiene homo- or co-polymer; and where the ABS-graft product has an average particle size of from 0.05 to 5μ;

(C) is from 0 to 10 parts, by weight of molding composition, of a resin-like, thermoplastic copolymer of acrylonitrile and styrene or methyl methacrylate where component (C) has a Staudinger index value which is greater than or equal to 3 (dl/g) and which is higher than the Staudinger index value of component (B);

(D) is from 5 to 40 parts, by weight of molding composition, of a copolymer comprising

from 10% to 99.9% based on the weight of (D), of an acrylic ester of an alcohol containing from one to fifteen carbon atoms;

from 0% to 90%, based on the weight of (D), of a bifunctional or polyfunctional monomer containing conjugated or unconjugated double bonds; and

from 0% to 40%, based on the weight of the remainder of (D), of acrylonitrile, vinyl acetate, methacrylic acid alkyl esters of alcohols having one to eight carbon atoms or mixtures thereof, where component (D) is uncrosslinked or partially cross-linked and component (D) or the uncrosslinked parts thereof have an average molecular weight of from 1000 to 2,000,000; and

(E) is from 3 to 30 parts, by weight of molding composition, of a copolymer comprising

from 60% to 95%, based on the weight of (E), of a monomer containing 2 conjugated olefinic double bonds or an acrylic ester of an alcohol containing one to six carbon atoms or mixtures thereof and;

from 5% to 40%, based on (E), of styrene, acrylonitrile, methacrylic acid methyl ester or mixtures thereof; where component (E) has a gel content of greater than or equal to 70% and component (E) is different from component (D).

4,518,744
PROCESS OF MELT SPINNING OF A BLEND OF A FIBRE-FORMING POLYMER AND AN IMMISCIBLE POLYMER AND MELT SPUN FIBRES PRODUCED BY SUCH PROCESS

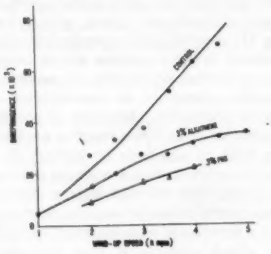
Harry Brody, Harrogate, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Nov. 4, 1982, Ser. No. 439,295

Claims priority, application United Kingdom, Nov. 23, 1981, 8135250

Int. Cl.³ D01D 5/02

U.S. Cl. 525—184 5 Claims



1. A process of melt spinning a fibre-forming polymer selected from the group consisting of polyethylene terephthalate, polyhexamethylene adipamide or polypropylene at a minimum wind up speed of 2 kilometer per minute, the improvement being that, before melt spinning, there is added to the fibre-forming polymer, between 0.1% and 10% by weight of another polymer which is immiscible in a melt of the fibre-forming polymer, such other polymer having an average particle size of between 0.5 and 3 microns in the melt with the fibre-forming polymer immediately prior to spinning and having an extensional viscosity such that molten spheres of the other polymer, in which form it exists immediately prior to melt spinning, deform into microfibrils during melt spinning there being in the process at least a 20% suppression of wind up speed compared with the process carried out with the same throughput in the absence of the added polymer, the term at least 20% suppression of wind up speed meaning that certain properties of the spun fibre are those that would be obtained from a fibre spun at at least a 20% lower wind up speed, such properties in the case of polyethylene terephthalate including birefringence and extension-to-break, in the case of polyhexamethylene adipamide including extension-to-break and in the case of polypropylene including the true stress at 50% strain.

4,518,745
METAL CHELATES OF WATER SOLUBLE COPOLYMERS

Friedrich Engelhardt, Frankfurt, and Ulrich Greiner, Schöneck, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

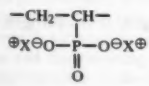
Filed Nov. 25, 1983, Ser. No. 554,950

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248019

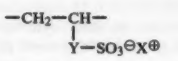
Int. Cl.³ C08F 8/44

U.S. Cl. 525—326.6 6 Claims

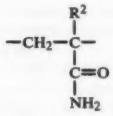
1. Metal chelates of water-soluble copolymers containing a statistical distribution of 1–86% by weight of structural units of the formula



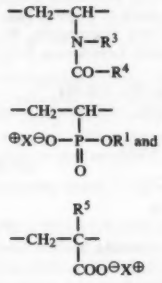
9–80% by weight of units of the formula



5–90% by weight of units of the formula



and up to 30% by weight of one or more units of the formulae



wherein R^1 is alkyl having 1 to 4 carbon atoms;

R^2 and R^5 independently of one another are each hydrogen or methyl;

R^3 and R^4 independently of one another are each hydrogen, methyl or ethyl or together are a trimethylene or pentamethylene;

Y is a direct bond, phenylene or a moiety of the formula —CO—NH—$C(CH_3)_2$—CH—; and

$X^{\oplus}$ is a cation or $H^{\oplus}$; and

wherein the chelating metal is polyvalent metal cations of the third to eighth groups and of the second sub-group of the periodic system of the elements and the ratio of copolymer to metal is 1:1 to 100:1 in terms of equivalents.

4,518,746
POLYESTER OLIGOMER AND HIGH SOLIDS THERMOSETTING COATINGS

Kazys Sekmakas, Palatine; Raj Shah, Schaumburg; Ronald J. Lewarchik, Arlington Heights, and Kevin P. Murray, Homewood, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 491,391, May 4, 1983, Pat. No. 4,459,401. This application Mar. 15, 1984, Ser. No. 589,728

Int. Cl.³ C08L 61/28

U.S. Cl. 525—443 9 Claims

1. A thermosetting organic solvent solution coating composition containing at least about 50% of total solids and comprising volatile organic solvent having dissolved therein an essentially linear polyester oligomer having hydroxyl and carboxyl terminal groups for subsequent cure and formed by adducting approximately equimolar amounts of diol carrying two primary hydroxyl groups and a dicarboxylic acid anhydride to form an hydroxy acid, esterifying the carboxyl groups of said hydroxy acid by reaction with an approximately stoichiometric proportion of diol carrying one primary hydroxyl group and one secondary hydroxyl group, the stoichiometry being based on the total hydroxyl content of the diol and the carboxyl content of the hydroxy acid, to form an hydroxyl-terminated oligomer, and then adducting said hydroxyl-ter-

minated oligomer with a polycarboxylic acid monoanhydride having a carboxyl functionality of at least 3, said monoanhydride being used in an amount of 0.01 to 0.15 equivalents of anhydride per hydroxyl equivalent in said hydroxyl-terminated oligomer, whereby the polyester oligomer so-produced is essentially linear and possesses low solution viscosity at high resin solids content, and from 3% to 50% of total resin solids of an amino-plast resin or phenoplast resin curing agent.

4,518,747

POLYCARBONATES HAVING TERMINAL GROUPS WHICH CONTAIN CONJUGATED DOUBLE BONDS

Wolfgang Stix; Ludwig Bottenbruch, both of Krefeld, Fed. Rep. of Germany, and Dieter Neuray, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 525,381

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232391

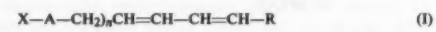
Int. Cl.³ C08G *63/62*

U.S. Cl. 525—462 **10 Claims**

1. A process for the preparation of an aromatic polycarbonate comprising reacting

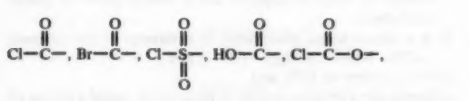
(i) at least one diphenol

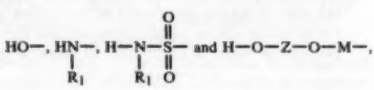
(ii) at least one chain terminator conforming to the formula



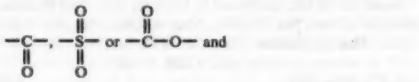
$$X{-}A{-}(CH_2)_n{-}CH{=}CH{-}CH{=}CH{-}R \qquad (I)$$

wherein R is an aromatic radical or a C_1–C_8 alkyl, n is an integer of between 0 and 7, X is selected from the group consisting of

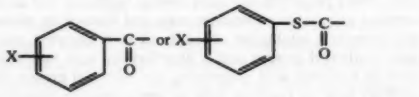




wherein R_1 is an aromatic radical or a C_1–C_6 aliphatic radical and where —O—Z—O— is a diphenolate radical and —M— is



X—A— is either X— or



in an amount of about 1 to about 20 mol % relative to the mols of said (i) and

(iii) phosgene which polycarbonate has a weight average molecular weight between about 5,000 and about 100,000.

4,518,748

CURABLE EPOXY RESIN MIXTURES

Theobald Haug, Frenkendorf, and Friedrich Stockinger, Hölstein, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,684

Claims priority, application Switzerland, Jan. 13, 1983, 174/83

Int. Cl.³ C08L *63/02*

U.S. Cl. 525—481 **16 Claims**

1. A curable mixture comprising

(a) an epoxide compound with on average more than one 1,2-epoxide group per molecule,

(b) a condensate prepared in an acid medium from a phenol, amine and aldehyde or ketone, which is obtainable by reacting (1) a substituted monohydric phenol which is unsubstituted in the p-position and in one of the two o-positions or in both o-positions, an unsubstituted dihydric mononuclear phenol or an unsubstituted or substituted dihydric or polyhydric, dinuclear or polynuclear phenol which contains at least two reactive nucleus positions for reaction with an aldehyde or ketone, (2) a substituted aromatic monoamine which contains at least one reactive nucleus position for reaction with an aldehyde or ketone, an unsubstituted aromatic mononuclear or dinuclear diamine or a substituted aromatic mononuclear or dinuclear diamine which contains at least two reactive nucleus positions for reaction with an aldehyde or ketone, and (3) an aldehyde or ketone, with one another at a pH value of not more than 6, the molar ratio of phenol to amine to aldehyde or ketone in the reaction mixture being 1:1:1.2 to 6:1:8, and 0.9 to 1.5 equivalents of active hydrogen atoms, based on the OH and NH_2 group, being present in the curable mixture per 1 epoxide equivalent.

4,518,749

EPOXY RESIN CURATIVES

Harold G. Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,028

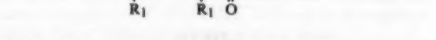
Int. Cl.³ C08G *59/42*

U.S. Cl. 525—504 **13 Claims**

1. An epoxy resin composition comprising:

(A) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule and

(B) a curing amount of the curing agent:



$$HO_2CCH{=}CHC{-}NH{-}R{-}NH{-}CCH{=}CHCO_2H$$

wherein C is carbon, N is nitrogen, H is hydrogen, O is oxygen and R is the radical

$$-CH(CH_3)CH_2[OCH_2CH(CH_3)]_x-$$

wherein x is an integer of from 2 to 35, and

(C) anhydride in a weight ratio of curing agent to anhydride of 1:5 to 5:1.

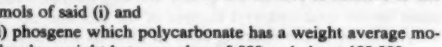
7. An epoxy resin composition comprising:

(A) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule and

(B) a curing amount of the curing agent:

$$HO_2CCH{=}CHC{-}NH{-}R{-}NH{-}CCH{=}CHCO_2H$$

wherein C is carbon, N is nitrogen, H is hydrogen, O is oxygen and R is the radical



$$-CH(CH_3)CH_2[OCH_2CH(CH_3)]_x-$$

wherein x is an integer of from 2 to 35, and

(C) carboxylic acid in a weight ratio of curing agent to carboxylic acid of 1:5 to 5:1.

4,518,750

FLUID BED REACTOR

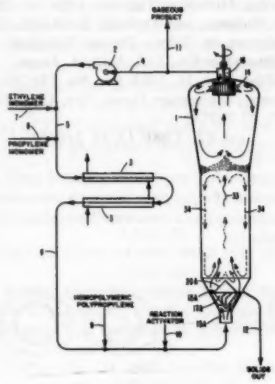
Gabriele Govoni; Canzio Corazzari; Giovanni Di Stefano, and Mauro Loconsolo, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 9, 1983, Ser. No. 473,553

Claims priority, application Italy, Mar. 10, 1982, 20062 A/82

Int. Cl.³ C08F *2/00*; C08G *85/00*

U.S. Cl. 526—68 **2 Claims**



1. Process for the polymerization and copolymerization of alpha-olefins in a gaseous phase, on a fluid bed consiting of polymerized material containing a catalyst, characterized in that said process is carried out in a fluid bed reactor comprising a distributor of fluidization gases which comprises a double cone body consisting of:

(a) a lower conical element, arranged with the vertex turned downwards, provided with more than two ribs on the lateral surface, said ribs having such a profile as to form, together with the wall of the containing shell, flow channels with a decreasing cross-section in an upward direction so that the velocity of the gas will increase gradually and correspondingly, the ribs being arranged diametrically opposite to each other with an axial symmetry and with an inclination with respect to the vertical such as to impart to the inflowing gas current a tangential component, the profile and inclination of the ribs being such as to allow the passage of the solid particles entrained by the inflowing gas, and so as to hinder the falling back of the particles of the fluidized bed whenever the feeding in of the gas is interrupted; and of

(b) an upper conical element, wth its vertex turned upwards, superimposed onto the lower conical element and having the function of activating the circulation of the solid in the fluidized bed, eliminating the dead or stagnation zones, said process being further characterized in that the distributor in the fluid bed reactor in which it is carried out comprises devices for recycling of the gas, which distributor and the recycling devices allow the passage of the solid particles of the fluidized material entrained by the recylcing gas.

4,518,751

PROCESS FOR THE PRODUCTION OF POLYETHYLENE

Shigeyoshi Mizogami, and Shinichi Akimoto, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jun. 5, 1981, Ser. No. 270,858

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—114 **11 Claims**

1. A process for the production of polyethylene characterized by using a catalyst consisting of the following components (A) and (B)

(A) a solid product prepared by reacting the reaction product of (i) a compound containing titanium, magnesium and halogen, and (ii) at least one compound selected from the group consisting of tetraalkoxyzirconium, zirconium tetrahalide and tetraalkoxytitanium, with an organoaluminum halide compound of the general formula: $AlR^1_nX^1_{3-n}$ wherein R^1 is an alkyl group, X^1 is a halogen atom, and $0<n<3$ or a halogen-containing titanium compound of the general formula $Ti(OR^2)_mX^2_{4-m}$, wherein R^2 is an alkyl group, X^2 is a halogen atom, and $0 \leqq m < 4$; and

(B) an organoaluminum compound;

said compound (i) containing titanium, magnesium and halogen being prepared by reacting a magnesium dialkoxy compound with a silicon halide, an alcohol and a titanium halide in that sequence.

4,518,752

PROCESS FOR POLYOLEFINS PRODUCTION

Nobuyuki Kuroda, Yokohama; Toru Nakamura, Kawasaki; Yutaka Shikatani, Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 329,028, Dec. 9, 1981, abandoned. This application Nov. 15, 1983, Ser. No. 551,516

Claims priority, application Japan, May 7, 1981, 56-68685

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—116 **10 Claims**

1. A process for production of polyolefins which comprises homopolymerization or copolymerization of α-olefins at a temperature of 20° to 120° C. and a pressure of atmosphere to 70 kg./cm.² in the presence of a catalyst comprising a solid catalyst component and an organoaluminum compound, said solid catalyst component being obtained by the reaction of: (a) a magnesium dihalide, (b) a compound of the formula $Me(OR)_nX_{z-n}$ where Me is, an element selected from Mg, B, P and Zn, R is a hydrocarbon residual group having 1-24 carbon atoms, X is a halogen atom, z represents the valence of Me and n is 1 to z and where the mol ratio of said magnesium dihalide (a) to said compound (b) in terms of Mg/Me is in the range of 1/0.05-1/0.5 and (c) a compound of the formula $Si(OR')_mX_{4-m}$ in an amount of 0.1-50 grams per 100 grams of said magnesium dihalide (a), where R' is a hydrocarbon residual group having 1-20 carbon atoms, X is a halogen atom, and m is 1 to 4, and (d) a titanium compound and/or a vanadium compound.

4,518,753

ANIONIC POLYMERIZATION OF CONJUGATED DIENES IN THE PRESENCE OF HINDERED TRIARYL BORON OR ALUMINUM DERIVATIVES

David H. Richards, Waltham Abbey, and Malcolm J. Stewart, Watford, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 15, 1983, Ser. No. 485,586

Claims priority, application United Kingdom, Apr. 26, 1982, 8212033

Int. Cl.³ C08F *4/52*

U.S. Cl. 526—177 **21 Claims**

1. A process for the production of a diene polymer having a relatively narrow molecular weight range by the anionic

polymerisation of a conjugated 1,3-diene in a polar solvent wherein the 1,4-content of the polymer is enhanced and is at least about 20%, comprising:

(a) contacting the 1,3-diene with an organo alkali or alkaline earth metal initiator in the presence of a sterically hindered triaryl derivative of a group III element which is boron or aluminum,

(b) allowing the 1,3-diene to polymerise in a polymerisation reaction in the polar solvent, and

(c) terminating the polymerisation reaction.

4,518,754

IMIDO COPOLYMERS

Jean L. Locatelli, Vienne, and Bernard Rollet, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

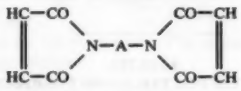
Filed May 30, 1979, Ser. No. 43,812

Claims priority, application France, May 30, 1978, 78 16013

Int. Cl.³ C08F *22/40*

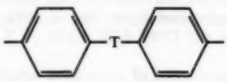
U.S. Cl. 526—262 **32 Claims**

1. An imido copolymer consisting essentially of the reaction product of copolymerization between (i) a bis-maleimide having the structural formula (I):



(I)

wherein A is phenylene or a divalent radical having the structural formula (II):



(II)

in which T is $-CH_2-$, $-C(CH_3)_2-$, $-O-$ or $-SO_2-$; and (ii) an olefinically unsaturated comonomer copolymerizable therewith, said comonomer (ii) displaying a degree of reactivity such that its resonance Q ranges from 0.01 to 0.7 and its polarity e is 0 or less and with the ratio of the number of imide functions to the number of molecules of the olefinically unsaturated comonomers (ii) ranging from 0.3 to 5.

4,518,755

IMIDO COPOLYMERS

Jean L. Locatelli, Vienne, and Bernard Rollet, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

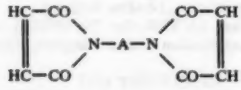
Filed May 30, 1979, Ser. No. 43,813

Claims priority, application France, May 30, 1978, 78 16012

Int. Cl.³ C08F *22/40*

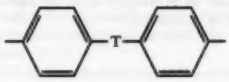
U.S. Cl. 526—262 **25 Claims**

1. An imido copolymer consisting essentially of the reaction product of copolymerization between (i) a bis-maleimide having the structural formula (I):



(I)

wherein A is phenylene or a divalent radical having the structural formula (II):



(II)

in which T is $-CH_2-$, $-C(CH_3)_2-$, $-O-$, or $-SO_2-$; and (ii) a (meth)-acrylic acid amide comonomer copolymerizable therewith, with the ratio of the number of imide functions to the number of moles of (meth)acrylic acid amide (ii) ranging from 0.25 to 8.

4,518,756

BIPHENYLOXY MONO- AND DIMETHACRYLATE POLYMERIZABLE COMPOSITIONS

Haruo Yoshida; Hirotaka Tagoshi, both of Oita; Yasushi Morohashi, Saitama, and Toshiaki Tanikoshi, Gunma, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Showa Highpolymer Co., Ltd., both of, Japan

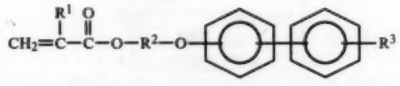
Filed Nov. 14, 1983, Ser. No. 551,763

Claims priority, application Japan, Nov. 11, 1982, 57-196739; Nov. 22, 1982, 57-203732

Int. Cl.³ C08F *12/24, 216/12*

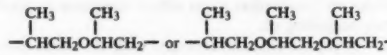
U.S. Cl. 526—313 **13 Claims**

1. A polymerizable composition capable upon polymerization of production of a polymer having a refractive index of at least 1.57 comprising (A) a mono(meth)acrylate represented by general formula (I):

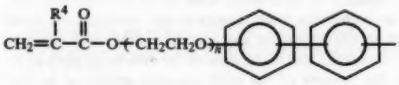


(I)

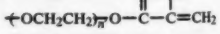
wherein R^1 represents a hydrogen atom or a methyl group, R^2 represents a divalent hydrocarbon group of 2 to 4 carbon atoms which may be substituted with a methyl group and/or a hydroxyl group, $-CH_2CH_2OCH_2CH_2-$, $-CH_2CH_2OCH_2CH_2OCH_2CH_2-$,

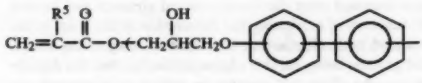


and R^3 and R^3 represents a hydrogen atom, a chlorine atom, a bromine atom, an alkyl group, an alkoxy group, an aryl group or an aryloxy group; and (B) a di(meth)acrylate represented by the general formula (II), (III) or (IV):

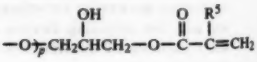


(II)





(III)



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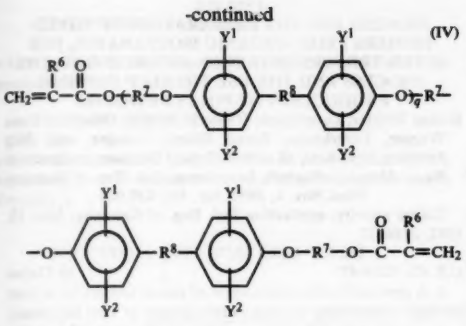


(IV)

wherein R^4, R^5 and R^6 each represents a hydrogen atom or a methyl group, R^7 represents a divalent hydrocarbon group of 2 to 4 carbon atoms which may be substituted with a methyl group and/or a hydroxy group, R^8 represents a divalent hydrocarbon group of 1 to 3 carbon atoms, Y^1 and Y^2 each represents a hydrogen atom, a chlorine atom or a bromine atom, n and n' each is an integer of 1 to 3, p is an integer of 1 to 4, and q is 0 or an integer of 1 to 3, provided that q is 0 when R^7 is a group having no hydroxy groups and wherein the ratio of (A) to (B) is from 3:7 to 3:1.

4,518,757

DRAG REDUCTION AGENT FOR HYDROCARBON LIQUID

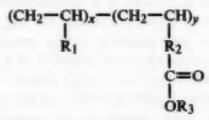
Donald N. Schulz, Annandale; Kissho Kitano, Fanwood, both of N.J.; Terry J. Burkhardt, Crosby, Tex., and Arthur W. Langer, Watchung, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1983, Ser. No. 565,100

Int. Cl.³ C08F *220/10*

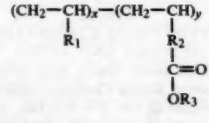
U.S. Cl. 526—329 **4 Claims**

1. A copolymer having the formula:



wherein R_1 is an alkyl group having about 5 to about 25 carbon atoms, R_2 is an alkylene group having about 1 to about 17 carbon atoms and R_3 is an alkyl group having about 1 to about 25 carbon atoms, x is about 95.0 to about 99.95 mole % and y is about 0.05 to about 5.0 mole %.

3. A method for reducing the frictional drag of a hydrocarbon solution in flow through pipes comprising adding a quantity of a copolymer to said hydrocarbon solution, said copolymer having the formula:



wherein R_1 is an alkyl group having about 5 to about 25 carbon atoms, R_2 is an alkylene group having about 1 to about 17 carbon atoms and R_3 is an alkyl group having about 1 to about 25 carbon atoms, x is about 95.0 to about 99.95 mole % and y is about 0.05 to about 5.0 mole %.

4,518,758

ORGANOPOLYSILOXANE/POLYURETHANE ELASTOMERIC BLOCK COPOLYMERS

Jacques Cavezzan, Villeurbanne, and Christian Prud'Homme, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

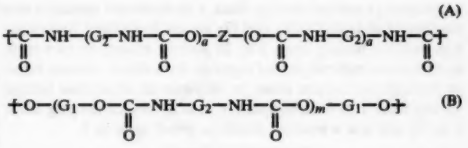
Filed Sep. 24, 1982, Ser. No. 423,259

Claims priority, application France, Sep. 30, 1981, 81 18573

Int. Cl.³ C08G *18/61, 77/26, 77/42*

U.S. Cl. 528—12 **11 Claims**

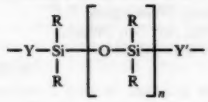
1. An organopolysiloxane/polyurethane thermoplastic elastomeric block copolymer having improved thermomechanical properties and a modulus of elasticity which is substantially constant within the temperature range from ambient temperatures to 160° C. consisting essentially of the following recurring units (A) and (B):



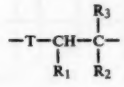
(A)

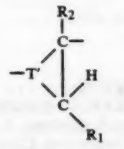
(B)

wherein Z is a divalent radical which comprises a polysiloxane block and has the formula:

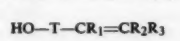


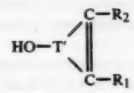
in which Y and Y' are each a divalent radical having one of the formulae:





wherein T and T' comprise the divalent or trivalent residue having from 1 to 20 carbon atoms of an unsaturated isocyanate or alcohol having one of the formulae:





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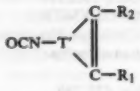


or an oxygen, sulfur, silicon, nitrogen, ester or amide interrupted such T or T' residue, and further wherein R_1, R_2 and R_3 are each hydrogen, alkyl or aryl, with the proviso that two of the radicals R_1 and R_2 may together form a single alkylene radical; each R is an alkyl or halogenoalkyl radical having from 1 to 5 carbon atoms and containing from 1 to 7 chlorine and/or fluorine substituents, cycloalkyl or halogenocycloalkyl radical having from 3 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine substituents, aryl, alkylaryl or halogenoaryl radical having from 6 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine substituents, or a cyanoalkyl radical having from 3 to 4 carbon atoms; n is a number of at least 10; G_1 and G_2 are each divalent hydrocarbon radicals having from 2 to 20 carbon atoms, or two such hydrocarbon radicals joined together by a direct valence bond or through an oxygen atom or alkylene or alkylidene bridge having from 1 to 4 carbon atoms; m is a number ranging from 1 to 20; and a is a number which is either zero or 1.

4,518,759

SYNTHESIS OF ARYLENE SILOXANYLENE POLYMERS AND COPOLYMERS

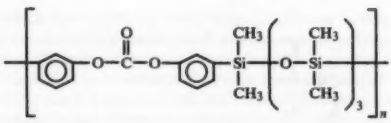
Harold Rosenberg, and Tsu-tzu Tsai, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,032

Int. Cl.³ C08G *77/60*

U.S. Cl. 528—35 **6 Claims**

1. An arylene siloxanylene polymer having a molecular weight (number average) of at least about 100,000 having repeating units of the general formula



wherein n ranges from about 300 to about 1500.

4,518,760

PROCESS FOR PRODUCING POLY(DITHIOCARBAMATE) CHELATING RESINS

Maurice R. Smith, Cleveland, and Harvey B. Cochran, Englewood, both of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 532,111, Sep. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 426,313, Sep. 29, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,806

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—48 **31 Claims**

1. A process for producing a poly(dithiocarbamate) resin chelating agent comprising:

(a) dissolving a polyimine in an alcohol solvent to form a polyimine solution.

(b) admixing a polyisocyanate in said polyimine solution to produce a cross-linked polyamine-polyurea precursor resin, and

(c) reacting said cross-linked polyamine-polyurea precursor resin with a mixture of NH_4OH and CS_2 to produce said poly(dithiocarbamate) resin chelating agent.

4,518,761

PROCESS FOR THE PREPARATION OF MIXED TRIMERS FROM ORGANIC ISOCYANATES, THE MIXED TRIMERS OBTAINED ACCORDING TO THE PROCESS AND THE USE THEREOF FOR THE PRODUCTION OF POLYURETHANES

Roland Richter, Leverkusen; Hanns P. Müller, Odenthal; Kuno Wagner, Leverkusen; Bernd Riberi, Cologne, and Jürg Fröhlich, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,086

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1981, 3144672

Int. Cl.³ C08G *18/70*; C07D *251/34*

U.S. Cl. 528—67 **10 Claims**

1. A process for the preparation of mixed trimers by at least partially trimerizing the isocyanate groups of two isocyanate components with different reactivities in the sense of the trimerization reaction in the presence of a trimerization catalyst which comprises

(a) adding the less reactive isocyanate component to a reaction vessel,

(b) trimerizing at least about 0.1% of the isocyanate groups of said less reactive isocyanate component in the presence of a trimerization catalyst,

(c) metering the more reactive isocyanate component into said reaction vessel and, optionally,

(d) terminating the trimerization reaction at the desired degree of trimerization by thermal decomposition of said trimerization catalyst and/or by adding a catalyst poison.

4,518,762

PROCESS FOR MAKING EPOXY NOVOLAC RESINS WITH HIGH EPOXY VALUES

Ulf A. Krueger, Coventry, and Thomas M. Meshako, West Warwick, both of R.I., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,177

Int. Cl.³ C08G *59/40, 59/00*

U.S. Cl. 528—95 **9 Claims**

1. An improved process for the production of an epoxy novolac resin, having a higher than normal epoxy value, wherein a novolac is reacted at a temperature of 40°–100° C., in the absence of any catalyst specific for the formation of the chlorohydrin ether intermediate, in the presence of 2 to 25% by weight, based on the reaction mixture, of a lower alkanol or lower alkoxyalkanol cosolvent, with excess epichlorohydrin, based on the phenolic hydroxyl value, in the presence of 0.5 to 8% by weight of water, based on the reaction mixture, and with 0.9 to 1.15 equivalents of solid alkali metal hydroxide per phenolic hydroxyl group, to give the epoxy novolac, wherein the improvement comprises

having 0.5 to 8% by weight of water in the reaction mixture throughout the reaction period,

using a solid alkali metal hydroxide in the form of beads of about 1 mm diameter, which hydroxide is charged to the reaction mixture portionwise or continuously during a gradually escalating addition program, and

isolating the epoxy novolac resin.

4,518,763

COPOLYESTERS FROM ETHER-CONTAINING GLYCOLS AND ACIDS

Robert B. Barbee, and Burns Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 570,146, Jan. 12, 1984, abandoned. This application May 21, 1984, Ser. No. 612,513

Int. Cl.³ C08G *63/66, 63/68*

U.S. Cl. 528—173 **11 Claims**

1. A polyester prepared by reacting a dicarboxylic acid component comprising at least 90 mole % of an acid of the general formula

$HO_2CH_2CX(RX)yCH_2CO_2H$

where y = zero or one, and at least 75 mole % of a diol of the general formula

$HOCH_2CH_2XRXCH_2CH_2OH$

wherein R in each of said formulas is an aromatic moiety comprising 6 to 24 carbon atoms and X in each of the above formulas is

$-O-$, $-S-$, $-\underset{\underset{H}{|}}{N}-$.

4,518,764
DIALLYL TEREPHTHALATE COPOLYMER AND COMPOSITION COMPRISING SAID COPOLYMER

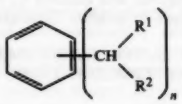
Motomu Tanaka, Kobe; Masanari Osuka, Toyonaka; Takeshi Kuri, Nishinomiya, and Sadao Takakuwa, Suita, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed Oct. 28, 1983, Ser. No. 546,533
Claims priority, application Japan, Oct. 30, 1982, 57-189981; Jan. 24, 1983, 58-10056
Int. Cl.³ C08G *83/00*
U.S. Cl. 528—271 **9 Claims**

1. A diallyl terephthalate copolymer derived from diallyl terephthalate represented by the following formula

(1)

and an aromatic benzyl hydrocarbon having at least one hydrogen atom at the benzyl position and represented by the following formula



(2)

wherein each of R^1 and R^2 represents a member selected from the class consisting of a hydrogen atom and lower alkyl groups, and n is an integer of 1 to 3,

said copolymer having the following characteristics (a) to (f):

(a) the copolymer has such a structure wherein one monomeric unit of formula (2) is bonded to the allyl group of the monomeric unit of formula (1) at

3 3' 3 3'
C, C or both C and C

through a carbon-carbon bond at the benzyl position,

(b) the number of the monomeric units of formula (1) at a carbon-carbon bonded molecular chain segment formed from the allyl groups of the monomeric unit of formula (1) in the copolymer is from 3 to 11,

(c) the copolymer has a degree of unsaturation, measured by the Wijs method, of from 40 to 85,

(c) the copolymer has a true specific gravity at 30° C. of from 1.20 to 1.25,

(e) the copolymer has a number average molecular weight ($\overline{Mn}$) of from 4,000 to 10,000 and a weight average molecular weight ($\overline{Mw}$) of from 70,000 to 200,000 measured by gel-permeation chromatography (GPC) and calculated as polystyrene, and

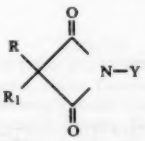
(f) the copolymer has a molecular weight distribution, represented by the ratio of $\overline{Mn}$ to $\overline{Mw}$, of from 10 to 40.

4,518,765
ANIONIC POLYMERIZATION OF LACTAM WITH AZETIDINE-2,4-DIONE PROMOTER

Steven J. Grossman, Cheshire, and Kemal Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

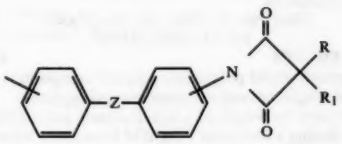
Filed Mar. 19, 1984, Ser. No. 591,310
Int. Cl.³ C08G *69/20*
U.S. Cl. 528—314 **9 Claims**

1. In a process for the preparation of a nylon polyamide by polymerizing a lactam in contact with an anionic polymerization catalyst and a promoter, the improvement wherein the promoter is a compound containing an azetidine-2,4-dione moiety having the formula



I

wherein R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl and R and R_1 taken together with the carbon atom to which they are joined represent cycloalkane having 4 to 8 ring carbon atoms, inclusive, and Y is selected from the group consisting of hydrocarbyl, hydrocarbyl substituted by one or more azetidine-2,4-dionyl rings, and radicals having the formula



wherein R and R_1 are as defiend above and Z is selected from the group consisting of —CO—, —O—, —SO_2—, and alkylene having 1 to 4 carbon atoms, inclusive.

4,518,766
POLYOXYALKYLENEDIOL-α,ω-BISALLYL POLYCARBONATE USEFUL AS A BASE FOR SEALANTS AND PROCESS FOR ITS PREPARATION

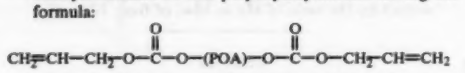
Alberto Greco, Milan, and Guglielmo Bertolini, Pavia, both of Italy, assignors to Enichimica Secondaria, S.p.A., Palermo, Italy

Filed Feb. 3, 1984, Ser. No. 576,869
Claims priority, application Italy, Feb. 11, 1983, 19532 A/83
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—370 **22 Claims**

1. A process for the preparation of a polycarbonate of polyoxyalkylenediol-α,ω-bisallyl, useful as a sealant base, comprising:

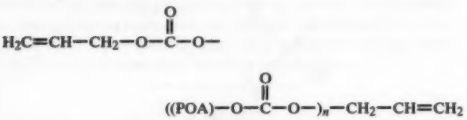
(a) a first stage of reaction comprising contacting a diallyl carbonate reactant and a polyoxyalkylenediol reactant having a molecular weight of from about 400 to about 4,500, in a molar ratio of from 2.5:1 to 10:1, and a catalytic amount of a transesterification catalyst, at a temperature equal to or higher than 100° C. and under a reduced pressure which permits the removal by vaporization of the allyl alcohol by-product being formed, without removing

or substantially removing by vaporization the unreacted diallyl carbonate, with the formation of the coresponding bisallylcarbonate of said polyoxyalkylenediol having the formula:



wherein (POA) is the radical of the polyoxyalkylenediol after removal of the terminal hydrogen therefrom, and

(b) a second stage reaction in which the bisallyl carbonate product as obtained in the first stage is treated to a temperature of from 70° C. to 150° C. under a pressure equal to or lower than Torr, in contact with a catalytic amount of said transesterification catalyst, so as to cause the chain extension of the bisallylcarbonate of the polyoxyalkylenediol together with the removal of the (1) unreacted bisallyl carbonate from the first stage and (2) diallylcarbonate which is formed as a by-product in the chain-extension reaction, to obtain a polycarbonate of the polyoxyalkylenediol-α,ω-bisallyl having the formula:



wherein (POA) has the same meaning as indicated above and n is an integer, the value of which, or the mean value of which, varies from 2 to 50.

4,518,767

CURING OF POLYSULFIDE LIQUID POLYMERS WITH ZINC OXIDE AND A SOURCE OF COPPER IONS

Edward G. Millen, Princeton, N.J., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 27, 1984, Ser. No. 574,447
Int. Cl.[3] C08G *75/04*
U.S. Cl. 528—374 **4 Claims**

1. A curable liquid polysulfide polymer composition having improved toughness and tear resistance, comprising:

A. 100 parts by weight of a liquid organic polysulfide polymer having a molecular weight of from about 500 to about 10,000;

B. about 2–20 parts by weight of zinc oxide; and

C. about 2–20 parts by weight of a copper salt.

4,518,768

REMOVAL OF BENZENE FROM CARBOXY POLYMETHYLENE RESIN

Heinrich P. Scheurer, and Kenneth K. H. Ong, both of Scarborough, Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 26, 1984, Ser. No. 593,328
Claims priority, application Canada, Apr. 13, 1983, 425798
Int. Cl.[3] C08F *120/02*
U.S. Cl. 528—483 **15 Claims**

1. Method for removal of benzene from carboxy polymethylene resin comprising:

(1) forming a solution phase containing about 0.1% to about 50% by weight of the resin, based on the weight of the solution, by dissolving the resin containing contaminant quantities of benzene-free liquid solvent therefor,

(2) providing a benzene-free gas phase, said gas phase is air, nitrogen, an inert gas, steam or a mixture thereof,

(3) forming a fine dispersion of one of said phases in the other,

(4) maintaining the dispersion at a temperature of about 0° C. to about 100° C.,

(5) maintaining the dispersion for a period sufficient to permit substantially all the benzene in the solution phase to transfer into the gas phase, and

(6) recovering a substantially benzene-free resin phase.

4,518,769

FRACTIONATION OF POLYMERS

Stephen H. Wu, and Clarence C. Dannelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 229,032, Jan. 26, 1981, Pat. No. 4,429,113, which is a continuation of Ser. No. 45,580, Jun. 4, 1979, abandoned. This application Oct. 20, 1983, Ser. No. 543,677
Int. Cl.[3] C08F *6/04*
U.S. Cl. 528—486 **4 Claims**

1. The process of obtaining a high molecular weight fraction from a polymer which comprises the steps of

(a) forming a solution of a polar polymer in a solvent which is also a solvent for a selected coacervating substance,

(b) mixing with said solution a coacervating simple acid or base having at least two proton donating or proton receiving groups which are opposite the polarity of said polar polymer in an amount sufficient to crosslink molecules of said polar polymer of a molecular weight above a selected range at the solution temperature, thereby forming coacervated high molecular weight polymer solids, said coacervating simple acid or base being selected from the group consisting of oxalic acid, malonic acid, succinic acid, adipic acid, sebacic acid, dimer acid, tartaric acid, phthalic acid, terephthalic acid, trimesic acid, trimellitic acid, 1,2,4,5-benzenetetracarboxylic acid, sulfonic acids, pyrophosphates, ethylenediamine, unsymmetrical dimethylethylenediamine, N,N,N'N'-tetraethylenediamine, trimethylenediamine, hexamethylenediamine, phenylenediamine, imidazole, pyrimidine, purine, nicotine and 2,2'-bipyridine, and

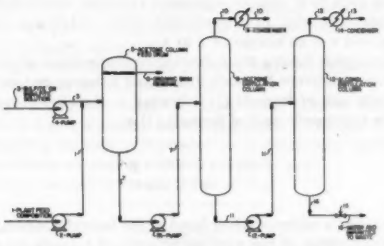
(c) separating the high molecular weight solids from the solution.

4,518,770

PROCESS FOR THE PREPARATION OF POLYHYDROXYBUTADIENES

Steven E. Kaplan, Houston, and Richard C. Frink, Baytown, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 30, 1984, Ser. No. 574,801
Int. Cl.[3] C08F *2/16, 136/04*
U.S. Cl. 528—487 **9 Claims**



1. In a process for the preparation of a polyhydroxybutadiene homopolymer wherein a diene monomer is polymerized in the presence of hydrogen peroxide catalyst and an alcohol solvent, said process including the recovery in a distillation unit of said alcohol solvent from a feed stream comprising unreacted butadiene, alcohol, hydrogen peroxide, water, acetone and vinylcyclohexene after preparation and recovery of polyhydroxybutadiene product, the improvement for reducing fouling of said distillation unit which comprises injecting into

the distillation unit, along with said feed stream from which the polyhydroxybutadiene has been essentially removed, an aqueous solution of an alkali metal sulfite or bisulfite.

4,518,771

PROCESS FOR THE PRODUCTION OF HEPARIN-CONTAINING PARTICULATE PRODUCTS

István Takács; György Kerey; János Illés; Péter Rudolf; Pál Gere; László Czebe, and Erzsébet Neszmélyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Division of Ser. No. 131,824, Mar. 19, 1980, Pat. No. 4,315,923. This application Dec. 23, 1980, Ser. No. 219,853

Int. Cl.³ C08B *37/10*

U.S. Cl. 536—21 **9 Claims**

1. Process for producing a heparin-enriched raw material capable of long-term storage to recover heparin therefrom, said process comprising the steps of:

(a) storing heparin-containing animal organ màterial in an aqueous medium at a temperature of substantially 10° to 50° C. for a preriod of substantially 0.5 to 15 hours;

(b) thereafter heat-treating the composition of step (a) at a temperature of 75° to 100° C. to precipitate a heparin-protein complex insoluble in water from the aqueous phase in the form of a readily filterable aggregate;

(c) filtering said aggregate from the aqueous phase; and

(d) drying said aggregate to produce a friable coherent particulate product with a 90 to 95% by weight dry substance content.

4,518,772

SYNTHESIS OF HIGHER POLYOL FATTY ACID POLYESTERS USING HIGH SOAP:POLYOL RATIOS

Robert A. Volpenhein, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 23, 1983, Ser. No. 507,826

Int. Cl.³ C07H *1/00*

U.S. Cl. 536—119 **18 Claims**

1. In a solvent-free transesterification process for synthesizing higher polyol fatty acid polyesters comprising the steps of:

(1) heating a mixture of (a) a polyol selected from a group consisting of monosaccharides, disaccharides and sugar alcohols, (b) a fatty acid ester selected from the group consisting of methyl esters, 2-methoxy ethyl esters, benzyl esters, and mixtures thereof, (c) an alkali metal fatty acid soap, and (d) a basic catalyst, to a temperature of from about 110° C. to about 180° C. at a pressure of from about 0.1 mm to about 760 mm of mercury to form a homogeneous melt; and

(2) subsequently adding to the reaction product of step (1) excess fatty acid ester selected from the group consisting of methyl esters, 2-methoxy ethyl esters, benzyl esters, and mixtures thereof;

the improvement wherein the molar ratio of soap:polyol in step (1) is from about 0.6:1 to about 1:1.

4,518,773

"3-CARBAMOYLOXY CEPHALOSPORINS"

Robert L. Cundall, Liverpool, and Derek Walker, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

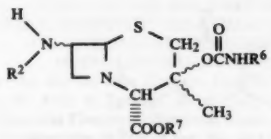
Division of Ser. No. 307,907, Oct. 2, 1981, Pat. No. 4,426,520, which is a division of Ser. No. 893,092, Apr. 3, 1978, Pat. No. 4,322,347. This application Aug. 19, 1983, Ser. No. 507,370

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ C07D *501/14;* A61K *31/545*

U.S. Cl. 544—16 **1 Claim**

1. A compound of the formula



in which R^2 is hydrogen or a conventional amino-protecting group;

R^6 is hydrogen, (lower)alkanoyl, chloroacetyl, dichloroacetyl, trichloroacetyl or p-toluenesulfonyl; provided that R^2 and R^6 may not both be hydrogen; and

R^7 is hydrogen or a conventional carboxyl-protecting group; or, when R^7 is hydrogen, a salt or ester thereof.

4,518,774

3-CEPHEM INTERMEDIATES

Ikuo Ueda, Toyonaka; Takao Takaya, Kawanishi; Masakazu Kobayashi, Hachitsuka; Takashi Masugi, Kitamachi; Hisashi Takasugi, Kohamanishi; Hiromu Kochi, Sakai, and Tadashi Kitaguchi, Kukuchinishimachi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

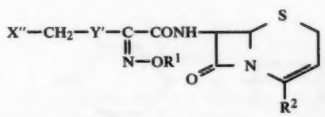
Division of Ser. No. 213,217, Dec. 5, 1980, Pat. No. 4,379,922, which is a division of Ser. No. 101,527, Dec. 10, 1979, Pat. No. 4,298,529, which is a continuation-in-part of Ser. No. 73,565, Sep. 7, 1979, abandoned. This application Aug. 25, 1982, Ser. No. 411,312

Claims priority, application Japan, Sep. 12, 1978, 53-112555; United Kingdom, Sep. 12, 1978, 7836564; Japan, Jan. 12, 1979, 54-3106; United Kingdom, Feb. 19, 1979, 7905791

Int. Cl.³ C07D *501/20;* A61K *31/545*

U.S. Cl. 544—22 **7 Claims**

1. A compound of the formula:



wherein

R^1 is an aliphatic hydrocarbon group,

R^2 is carboxy or a protected carboxy group,

X" is hydrogen or halogen and

Y' is lower alkylenedioxymethylene, di(lower) alkoxymethylene, or lower alkoxycarbonylhydrazonomethylene, or its salt.

4,518,775

BENZOXAZINE-4-ONE INTERMEDIATES

André Allais, Gagny; Francois Clèmence, Paris; Roger Deraedt, Pavillons S/S Bois, and Odile Lemartret, Paris, all of France, assignors to Roussel Uclaf, Paris, France

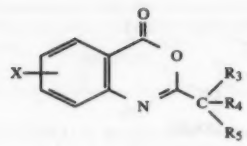
Division of Ser. No. 262,952, May 12, 1981, Pat. No. 4,397,856. This application May 17, 1983, Ser. No. 495,475

Claims priority, application France, May 19, 1980, 80 11100

Int. Cl.³ C07D *265/22*

U.S. Cl. 544—92 **1 Claim**

1. A compound of the formula



VIII

wherein X is in the 5,6,7 or 8 position and is selected from the group consisting of CF_3O—, CF_3S— and CF_3—, R_3 is selected from the group consisting of hydrogen, halogen and alkyl of 1 to 4 carbon atoms, R_4 is selected from the group consisting of hydrogen and halogens, R_5 is a halogen with the proviso that R_3, R_4 and R_5 can not all be fluorine.

4,518,776

PROCESS FOR PRODUCING SULFONYLUREAS

Willy Meyer, Riehen; Werner Föry, Basel, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

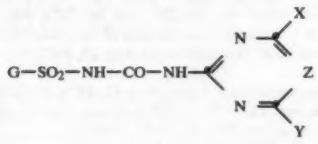
Filed Jul. 8, 1983, Ser. No. 511,830

Claims priority, application Switzerland, Jul. 19, 1982, 4396/82

Int. Cl.[3] **C07D** *251/46, 251/18, 239/69, 401/12*

U.S. Cl. 544—206 **11 Claims**

1. A process for producing a sulfonylurea of the general formula I

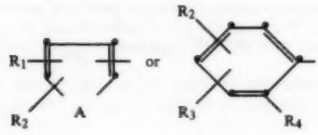


(I)

wherein

Z is an —N= or —CH= radical,

G is a radical of the formula



X is C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, halogen, C_1–C_4-haloalkoxy, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,

Y is C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkoxy,

A is oxygen, sulfur, —NR_5— or —C=N—, where R_5 is hydrogen, C_1–C_4-alkyl or —CO—C_1–C_4alkyl,

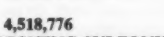
R_1 is hydrogen, C_1–C_4-alkyl, halogen, nitro, cyano, —NH_2, —$S(O)_n$—C_1–C_4-alkyl, —SO_2—C_1–C_4-alkoxy, —SO_2—di-C_1–C_4-alkylamino, —CHO, —$CONH_2$, —D—C_3–C_5-alkynyl, —CO—D—C_3–C_5-alkynyl, —D—C_1–C_4-alkyl, —D—C_3–C_5-alkenyl, —CO—C_1–C_4-alkyl, —CO—D—C_1–C_4-alkyl or —CO—D—C_3–C_5-alkenyl, n being one or two, and D being an oxygen, sulfur, —NH— or —N(C_1–C_4-alkyl)-bridge,

R_2 is hydrogen, halogen, CF_3, NO_2, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_3 is hydrogen, fluorine or chlorine, and

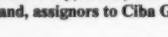
R_4 is halogen, C_1–C_4-alkyl, nitro, cyano, —NH_2, —$S(O)_n$—C_1–C_4-alkyl, —SO_2—C_1–C_4-alkoxy, —SO_2-di-C_1–C_4-alkylamino, —CHO, —$CONH_2$, —D—C_3–C_5-alkynyl, —CO—D—C_3–C_5-alkynyl, trifluoromethyl, or C_1–C_4-alkoxy substituted by cyano, halogen, C_1–C_4-alkoxy or C_1–C_4-alkylthio, or is —D—C_1–C_4-alkyl, —D—C_3–C_5-alkenyl, —CO—C_1–C_4-alkyl, 1,2-dichlorovinyloxy, —CO—D—C_1–C_4-alkyl or —CO—D—C_3–C_5-alkenyl, n being one or two, and D being an oxygen, sulfur, —NH— or —N(C_1–C_4-alkyl)-bridge,

which process comprises reacting a sulfonamide of the formula II



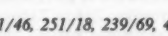
(II),

in the presence of a base, with a chloroformic acid ester of the formula III



(III),

or a sulfonyl chloride of the formula IV



(IV),

in the presence of a base, with a urethane of the formula V

(V),

wherein G has the meaning defined under the formula I,

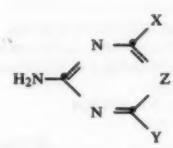
Q is oxygen or sulfur, and

T is C_1–C_4-alkyl, benzyl, C_1–C_4-haloalkyl, C_1–C_3-cyanoalkyl, C_2–C_5-alkenyl, or alkoxyalkyl or alkylthioalkyl having a total of at most 5 carbon atoms;

and converting the formed carbamate of the formula VI

(VI)

by reaction with an amine of the formula VII



(VII)

wherein G, Q, T, X, Y and Z have the meanings defined in the foregoing, into the sulfonylurea of the formula I.

4,518,777

METHYLENE PHOSPHONIC ACID SCALE INHIBITOR COMPOSITIONS DERIVED FROM AMINOHYDROCARCARBYLPIPERAZINE UREA ADDUCTS

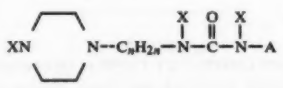
Druce K. Crump, Lake Jackson, and David A. Wilson, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 2, 1983, Ser. No. 528,835

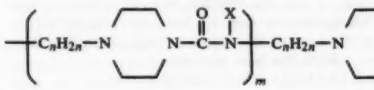
Int. Cl.[3] **C07D** *241/04, 403/12;* **C02F** *5/14*

U.S. Cl. 544—337 **19 Claims**

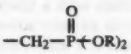
1. The compounds having the formula



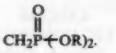
wherein A is



wherein X is



or H and wherein R is H, ammonium, an alkali or alkaline earth metal, m is 0–2, n is 2 or 3 and wherein at least one X is



4,518,778

POLYMER POLYOLS FROM ALKYLENE OXIDE ADDUCTS OF ALKANOLAMINES

Michael Cuscurida, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,599

Int. Cl.³ C07D *241/04*; C08G *18/28*; C07C *125/06*

U.S. Cl. 544—398 **16 Claims**

1. A polymer polyol made by the reaction of an alkylene oxide adduct of a hydroxyl-containing amine, a polyether polyol of about 3000 to 8000 molecular weight and an organic polyisocyanate wherein the ratio of equivalents of alkylene oxide adduct of hydroxyl-containing amine to equivalents of polyisocyanate ranges from about 1 to 4 and wherein the combined weight of adduct and polyisocyanate is about 5 to 30 wt.% of the polyether polyol.

9. A method for the production of a polymer polyol consisting essentially of reacting an alkylene oxide adduct of a hydroxyl-containing amine, a polyether polyol of about 3000 to 8000 molecular weight and an organic polyisocyanate wherein the ratio of equivalents of alkylene oxide adduct of hydroxyl-containing amine to equivalents of polyisocyanate ranges from about 1 to 4 and wherein the combined weight of adduct and polyisocyanate is about 5 to 30 wt.% of the polyether polyol.

4,518,779

1,2,3,4-TETRAHYDRO-1-AMINOMETHYL-4-PHENYL ISOQUINOLINES

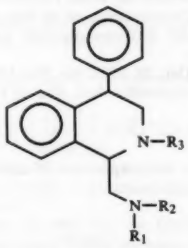
Ronald C. Griffith, Pittsford, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 27, 1982, Ser. No. 423,958

Int. Cl.³ C07D *217/14*; A61K *31/47*

U.S. Cl. 546—144 **14 Claims**

1. The compound



wherein R_1 and R_2 are from the class of hydrogen and lower alkyl, and R_3 is from the class of hydrogen, formyl, and lower alkyl and the pharmaceutically acceptable acid addition salts thereof.

4,518,780

PROCESS FOR THE PREPARATION OF 2-(5,5-DISUBSTITUTED-4-OXO-2-IMIDAZOLIN-2-YL)NICOTINIC ACIDS AND QUINOLINE-3-CARBOXYLIC ACIDS

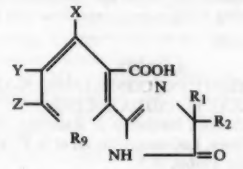
Jerry M. Barton, East Windsor; Don W. Long, and Kenneth D. Lotts, both of Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 381,818, May 25, 1982, abandoned. This application May 5, 1983, Ser. No. 489,400

Int. Cl.³ C07D *401/04*

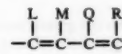
U.S. Cl. 546—167 **8 Claims**

1. A process for the preparation of a 2-(5,5-disubstituted-4-oxo-2-imidazolin-2-yl)nicotinic acid, 3-quinolinecarboxylic acid or benzoic acid of the formula:

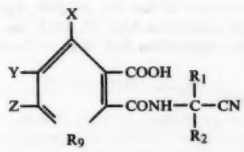


(IA)

wherein R_9 is N or CH; R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together along with the carbon to which they are attached, they may represent C_3–C_6 cycloalkyl optionally substituted with methyl, and when R_1 and R_2 are not the same, the optical isomers thereof; X is hydrogen, or C_1–C_4 alkyl, Y is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, trichloromethyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl or phenoxy optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; Z is hydrogen, C_1–C_4 alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer from 3 to 5, provided that X is hydrogen; or YZ is



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl, phenoxy or mono-substituted phenyl or phenoxy where the substituent is C_1–C_4 alkoxy or halogen; with the proviso that only one of L, M, Q or R_7, may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy; comprising, reacting a compound of the structure:



wherein R_9, X, Y, Z, W, R_1 and R_2 are as described above, with from 2 to 20 molar equivalents of an aqueous or aqueous alcoholic sodium or potassium hydroxide of a concentration of 10% or greater and from 0 to 10 molar equivalents of 30 to 90% aqueous hydrogen peroxide at a temperature of from 25° to 100° C. and thereafter acidifying the thus-formed reaction mixture to a pH between 2 and 4 with a strong mineral acid to give the formula (I) acid.

4,518,781
PROCESS FOR THE PREPARATION OF 3-HYDROXYMETHYL-6-CHLOROBENZOXAZOLONE

Noël Rouy, Yérres, and Francois Dewilde, Thiais, both of France, assignors to Rhone-Poulenc Agrochimie, Lyon, France

Division of Ser. No. 242,538, Mar. 11, 1981, Pat. No. 4,435,557. This application Nov. 30, 1983, Ser. No. 556,565

Claims priority, application France, Mar. 27, 1980, 80 07262

Int. Cl.³ C07D *498/04*

U.S. Cl. 548—221 **22 Claims**

1. A process for the preparation of 3-hydroxymethyl-6-chlorobenzoxazolone which comprises reacting 6-chlorobenzoxazolone in organic solution with formaldehyde in the presence of water and dioxane, the 6-chlorobenzoxazolone having been prepared by reacting benzoxazolone with molecular chlorine in the presence of water and dioxane wherein said organic solution being 6-chlorobenzoxazolone and dioxane.

4,518,782
FUEL COMPOSITIONS CONTAINING N-ALKYL GLYCYL IMIDAZOLINE

Rodney L. Sung, Fishkill; Benjamin J. Kaufman, Wappingers Falls, and Peter Dorn, LaGrangeville, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,583

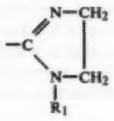
Int. Cl.³ C07D *233/06*; C10L *1/14*

U.S. Cl. 548—353 **3 Claims**

1. A friction-reducing, corrosion-inhibiting and detergent compound of the formula:

$$RNHCH_2X$$

wherein R is a hydrocarbyl group having 12 to 16 carbon atoms in the chain and X is



wherein R_1 is selected from the group consisting of hydrogen, a lower alkyl group having 1 to 5 carbon atoms and the radical $—CH_2CH_2NH_2$.

4,518,783
PROCESS FOR PRODUCING (-)-2-[1-(2,6-DICHLOROPHENOXY)-ETHYL]-1,3-DIAZACYCLOPENT-2-ENE

Jürgen Biedermann, Pulheim-Stommeln; Gerrit Prop, Pulheim, and Ille-Stephanie Doppelfeld, Bergheim-Glessen, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 367,946, Apr. 13, 1982, abandoned. This application May 27, 1983, Ser. No. 498,786

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3149009

Int. Cl.³ C07D *233/22*

U.S. Cl. 548—353 **2 Claims**

1. Process for producing (−)-2-[1-(2,6-dichlorophenoxy)-ethyl]-1,3-diazacyclopent-2-ene or a pharmaceutically acceptable acid addition salt thereof by subjecting a (−)-2-hydroxypropionic acid-C_{1-4}-alkyl ester to reaction with excess thionylchloride in the presence of catalytic quantities of dimethylformamide, subjecting the resulting (+)-2chloropropionic acid-C_{1-4}-alkyl ester to reaction with at least equimolar amounts of 2,6-dichlorophenol in an organic solvent in the presence of a base at a temperature ranging from 60° to 150° C., subjecting the resulting (−)-2-(2,6-dichlorophenoxy)-propionic acid-C_{1-4}-alkyl ester to reaction with a large excess of ethylene diamine at room temperature, subjecting the resulting (−)-2-(2,6-dichlorophenoxy)-propionic acid-N-(2-aminoethyl)-amide to dehydration with a titanium tetrachloride/tetrahydrofurane complex in an inert solvent in the presence of 4-dimethylamino pyridine at a temperature ranging from 0° to 30° C. and, if desired, converting the resulting (−)-2-(2,6-dichlorophenoxy)-ethyl]-1,3-diazacyclopent-2-ene into a physiologically acceptable acid addition salt thereof.

4,518,784
CYCLIC COMPOUNDS

Michael J. Broadhurst, Baldock; Cedric H. Hassall, Welwyn, and Gareth J. Thomas, Luton, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

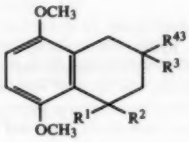
Continuation of Ser. No. 298,139, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 111,348, Jan. 11, 1980, Pat. No. 4,316,985. This application Feb. 23, 1984, Ser. No. 583,077

Claims priority, application United Kingdom, Jan. 16, 1979, 7901537; Jul. 26, 1979, 7926151

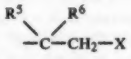
Int. Cl.³ C07D *339/06, 317/20*; C07C *69/95*

U.S. Cl. 549—39 **6 Claims**

1. The compound of the formula



wherein one of R^1 and R^2 represent a hydrogen atom and the other represents a hydroxy group, R^3 represents a hydroxy group and R^{43} represents a lower alkyl, carboxy, lower alkoxy carbonyl, benzyloxycarbonyl or a group of the formula:



in which R^5 and R^6 together form a oxo group or an ethylene ketal or ethylene thio ketal group and X represents a hydrogen atom or a hydroxy group or lower alkanoyloxy group, or

$$—(CH_2)_n—OY$$

in which n stands for 1 or 2 and Y represents a hydrogen atom or an alkyl or lower alkanoyl group.

4,518,785
MALONDIALDEHYDE TETRAALKYLACETALS AND THEIR PREPARATION

Heinz Eckhardt, Frankenthal; Klaus Halbritter, Mannheim, and Wolfgang Rohr, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

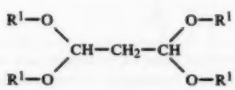
Filed Oct. 29, 1982, Ser. No. 437,683

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145709

Int. Cl.³ C07D *317/00, 317/22*

U.S. Cl. 549—453 **17 Claims**

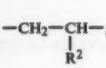
1. A process for the preparation of malondialdehyde tetraalkylacetals of the formula



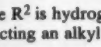
I

where the individual radicals R^1 may be identical or different

and each is alkyl, or alkoxy-substituted alkyl, and 2 adjacent R^1's may also be

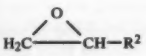


where R^2 is hydrogen or alkyl, which process comprises: reacting an alkyl formate of the formula



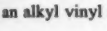
II

with an oxirane of the formula



III

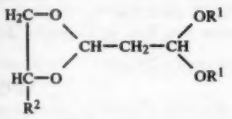
and an alkyl vinyl ether of the formula



IV

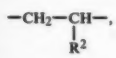
where R^1 and R^2 have the above meanings, in the presence of a catalyst selected from the group consisting of the halides of boron, antimony(V), iron(III), tin(II or IV) and zinc, using from 0.5 to 3.0 moles of starting material II per mole of starting material IV.

2. A 2(2',2'-dialkoxyethyl)-4-alkyl-(1,3)-dioxolane of the formula



Ia

where the individual radicals R^1 may be identical or different and each is alkyl or alkoxy-substituted alkyl, and the pair of R^1 radicals may also be



if R^2 is hydrogen or alkyl of more than one carbon atom,

4,518,786

N,N,N',N'-TETRAGLYCIDYL-1,3-PROPYLENE BIS(P-AMINOBENZOATE

David W. Wang, New Canaan, and Daniel R. Draney, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,856
Int. Cl.³ C07D *301/00*
U.S. Cl. 549—552 **1 Claim**

1. N,N,N',N'-tetraglycidyl-1,3-propylene-bis-(p-aminobenzoate).

4,518,787

SILYLATION PROCESS

Richard C. Treadgold, Cardiff, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Mar. 15, 1984, Ser. No. 589,797
Claims priority, application United Kingdom, Mar. 3, 1983
Int. Cl.³ C07F *7/08, 7/18*
U.S. Cl. 556—442 **4 Claims**

1. A process for silylating an organic or an organosilicon compound which comprises contacting an organic or an organosilicon compound having in the molecule one or more hydroxyl groups bonded to carbon or to silicon with both (i) a compound having the general formula

wherein each R represents an alkyl group having from 1 to 4 inclusive carbon atoms, the vinyl group or the phenyl group and x is an integer of from 2 to 6 inclusive and (ii) a compound having the general formula R'_3SiY, wherein each R' represents an alkyl group having from 1 to 6 inclusive carbon atoms, the vinyl group or the phenyl group and Y represents a chlorine, bromine or iodine atom.

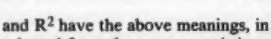
4,518,788

AROMATIC POLYVINYL ETHERS AND HEAT CURABLE MOLDING COMPOSITIONS OBTAINED THEREFROM

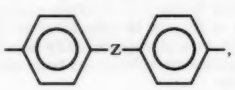
James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 243,302, Mar. 13, 1981, Pat. No. 4,388,450.
This application Jan. 20, 1983, Ser. No. 459,442
Int. Cl.³ C07C *69/76, 43/215, 43/205, 43/21*
U.S. Cl. 560—064 **10 Claims**

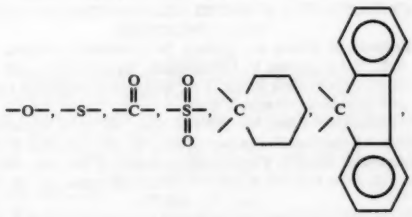
1. Aromatic polyvinylethers having the formula,



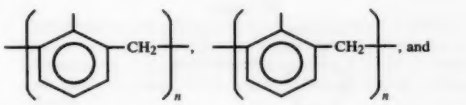
R^1 is a $C_{(1-8)}$ alkylene radical, R^2 and R^3 are the same or different monovalent radicals selected from hydrogen, halogen and $C_{(1-8)}$ alkyl radicals, R^9 is a polyvalent aromatic organic radical selected from the class consisting of phenylene, tolylene, xylylene, naphthalene, xenyl, anthrylene,

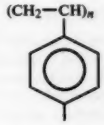


where Z is selected from



and polyvalent aromatic radicals selected from the class consisting of





and halogenated derivatives selected from the class consisting

of chlorophenylene and bromotolylene, where n is an integer equal to 2–10 inclusive.

4,518,789

PHENYL ALPHA-ACYLOXYACETAMIDE DERIVATIVES AND THEIR THERAPEUTIC USE

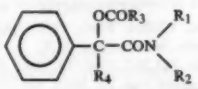
Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 1138 Sewell Ln., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 393,741, Jun. 30, 1982, abandoned. This application May 17, 1983, Ser. No. 495,159

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—105 **21 Claims**

1. A therapeutic composition comprising an antipruritic or antiinflammatory effective amount of a phenyl-alpha-acyloxyacetamide compound having the formula:



wherein

R_1, R_2=H, alkyl or aralkyl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 25 carbon atoms,

R_3=alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 25 carbon atoms;

R_4=H, alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 25 carbon atoms; and

the hydrogen atom of the phenyl, R_1, R_2, R_3 or R_4 may be substituted by a nonfunctional halogen or a radical such as a lower alkyl or alkoxy having 1 to 9 carbon atoms; and

the carbon atom of R_1 or R_2 may be substituted by a nonfunctional N, S or O, in a pharmaceutically acceptable vehicle for topical application to involved body areas or internal administration.

4,518,790

15-DEOXY-16-HYDROXY-16-VINYL AND CYCLOPROPYL SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

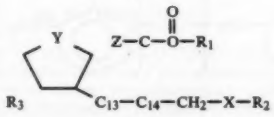
Continuation of Ser. No. 888,183, Mar. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 857,715, Dec. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Jul. 18, 1980, Ser. No. 466,751

The portion of the term of this patent subsequent to Dec. 3, 1994, has been disclaimed.

Int. Cl.³ C07C *177/00*

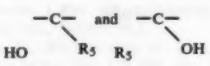
U.S. Cl. 560—118 **24 Claims**

1. An optically active compound of the formula:



or a racemic mixture of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is selected from the group consisting of alkyl having from 2 to 7 carbon atoms optionally substituted with one or two alkyl groups each having up to 3 carbon atoms; R_3 is hydroxy, alkanoyloxy having from 2 to 6 carbon atoms, alkoxy having from 1 to 3 carbon atoms, trialkyl (C_1–C_3) silyloxy and tetrahydropyran-2-yloxy; Y is a divalent moiety of the formulae:

X is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; Z is a divalent moiety selected from the group consisting of those of the formulae: $-(CH_2)_6-$, $-(CH_2)_n-S-CH_2-$ and $-(CH_2)_n-O-CH_2-$ wherein n is an integer from 3 to 5, inclusive; with the proviso that when Z is $(CH_2)_nSCH_2$, then R_3 must be hydrogen; the moiety $-C_{13}-C_{14}-$ is trans-vinylene and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,518,791

PREPARATION OF MENTHYL PERMETHRATE

Hans P. Sehnem, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

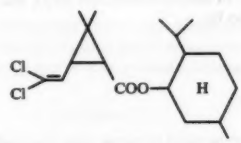
Continuation of Ser. No. 391,751, Jun. 24, 1982, abandoned. This application Apr. 3, 1984, Ser. No. 596,324

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127752

Int. Cl.³ C07C *67/02*

U.S. Cl. 560—124 **5 Claims**

1. A process for the production of menthyl permethrate of the formula



comprising reacting methyl permethrate or ethyl permethrate with menthol in the presence of about 1 to 30 mol % of an alkali metal alcoholate, relative to the methyl or ethyl permethrate, in a solvent consisting of an alcohol.

4,518,792

PROCESS FOR PREPARING N-BENZYLOXYCARBONYL-L-ASPARTIC ACID

Clay T. Chen, Edison; K. Ming Wan, East Brunswick, and Mary S. Chen, Edison, all of N.J., assignors to Hatco Chemical Corporation, Fords, N.J.

Filed Aug. 26, 1983, Ser. No. 526,579

Int. Cl.³ C07C *125/065*

U.S. Cl. 560—163 **22 Claims**

1. A method of synthesizing N-benzyloxycarbonyl-L-aspartic acid by condensing benzyl chloroformate and a dialkali metal salt of L-aspartic acid in an alkaline aqueous solution, comprising added benzyl chloroformate and an alkalai metal hydroxide solution to an alkaline aqueous mixture containing L-aspartic acid maintained at a pH of at least about 9.2 in the presence of at least one of a buffer and a surfactant and then acidifying the reaction mixture upon completion of the reaction, whereby the N-benzyloxycarbonyl-L-aspartic product is

of higher purity than product obtained at the same reaction conditions in the absence of a buffer and/or a surfactant.

4,518,793

PREPARATION OF ACETONE DICARBOXYLIC ACID DIESTERS

Shinichiro Uchiumi, and Kikuo Ataka, both of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Oct. 17, 1983, Ser. No. 542,356

Claims priority, application Japan, Oct. 26, 1982, 57-186686

Int. Cl.³ C07C *67/02, 67/36, 67/38, 69/716*

U.S. Cl. 560—175 **22 Claims**

1. A process for preparing an acetone dicarboxylic acid diester, which comprises reacting at a temperature of from −10° C. to 250° C. diketene, carbon monoxide and a nitrous acid ester in the presence of a catalyst comprising

(a) a palladium halide selected from the group consisting of palladium chloride, palladium bromide and palladium iodide, or

(b) a complex of a palladium halide selected from the group consisting of complexes of the formulae (i) $PdX_2(L\text{-}CN)_2$, wherein X is a halogen atom and L is an alkyl group having 1 to 20 carbon atoms or a phenyl group, (ii) M_2PdX_4 wherein M is an alkali metal and X is a halogen atom, or (iii) $(PdCl_2(olefin))_n$ wherein said olefin has 2 to 20 carbon atoms, and n is 1 or 2.

4,518,794

TELOMERS WHICH CAN BE CROSS-LINKED BY LIGHT

Bernard Boutevin, Montpellier; Willy-Jean Deiss, Grenoble; Marc Maliszewicz, Montpellier, and Yves Pietrasanta, Meze, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

PCT No. PCT/FR82/00122, § 371 Date Mar. 7, 1983, § 102(e) Date Mar. 7, 1983, PCT Pub. No. WO83/00336, PCT Pub. Date Feb. 3, 1983

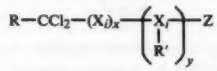
PCT Filed Jul. 20, 1982, Ser. No. 474,672

Claims priority, application France, Jul. 22, 1981, 81 14789

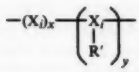
Int. Cl.³ C07C *69/533*

U.S. Cl. 560—192 **12 Claims**

1. Telomers of the general formula

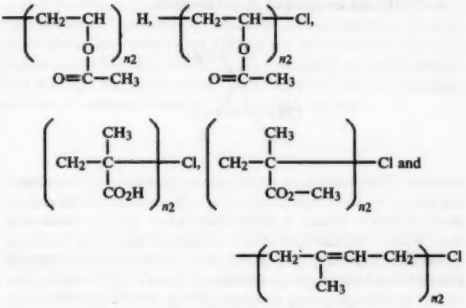


wherein the sequence of

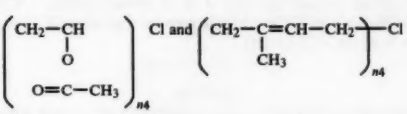


links emanates from an identical taxogen X_i with a free function, selected from the group consisting of primary alcohol, acid and secondary alcohol functions, and where the

links correspond to the esterified form of X_i, R' being the radical of the group used for esterification, $RCCl_2$— and —Z being the parts of the telogen $RCCl_2Z$ where —X is selected from the group consisting of —H, —Cl and —Br radicals, wherein X_i belongs to the group made up of sub-groups X_1, X_2, X_3, X_4 in which X_1 is selected from the group consisting of 2-hydroxy ethyl acrylate and 2-hydroxy ethyl methacrylate, X_2 is selected from the group consisting of acrylic acid and methacrylic acid, X_3 is vinyl alcohol, X_4 is allyl alcohol, $0<x\leqq500$, $1<y\leqq500$ $1<x+y\leqq1000$, wherein the group used for esterification has at least one double bond which can be cross-linked by light and is selected from the group consisting of acids and acid chlorides in the case of X_1, X_3 and X_4 and is an alcohol in the case of X_2 and wherein X_i is X_1, R is selected from the group consisting of Cl, CH_3OCO, CF_3, $-(CF_2-CFCl)_{n1}-Cl$ where $1\leqq n_1\leqq10$,



where $1\leqq n_2\leqq500$; when X_i is X_2, R is selected from the group consisting of Cl, CF_3 and $(CF_2-CFCl-)_{n3}Cl$ where $1\leqq n_3\leqq10$; when X_i is X_3, R is selected from the group consisting of Cl, $(C_2H_5O-)_2PO$,



where $1\leqq n_4<500$; and when X_i is X_4, R is selected from the group consisting of CCl_2-CO_2H, $CCl_2-CO_2CH_3$, CCl_3 and $(C_2H_5O-)_2PO$.

4,518,795

BIS(BETA-PENTABROMOPHENOXYETHYL) SUCCINATE, A FLAME RETARDANT FOR ABS

Yuval Halpern, Skokie, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Dec. 2, 1982, Ser. No. 446,124

Int. Cl.³ C07C *67/08, 69/34*

U.S. Cl. 560—193 **2 Claims**

1. The di-ester of beta-pentabromophenoxyethanol and succinic acid.

4,518,796

METHOD FOR PREPARING CARBOXYLIC ESTERS

Atsushi Aoshima, Yokohama; Yoshio Suzuki, Fuji; Setsuo Yamamatsu, Fuji, and Tatsuo Yamaguchi, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1980, Ser. No. 149,387

Claims priority, application Japan, May 17, 1979, 54-59631; May 17, 1979, 54-59632; May 17, 1979, 54-59634

Int. Cl.³ C07C *67/39*

U.S. Cl. 560—208 **11 Claims**

1. A method for producing a carboxylic ester comprising reacting an aldehyde with alcohol at 0° to 100° C. in the presence of oxygen and a solid catalyst comprising palladium and bismuth.

4,518,797
CYCLOPROPANECARBOXYLATE PESTICIDES AND THEIR PREPARATION

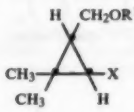
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 953,987, Oct. 23, 1978, abandoned. This application Mar. 15, 1979, Ser. No. 20,605

Int. Cl.[3] **C07C** *43/315, 53/44, 69/14, 69/16, 47/198, 47/37*

U.S. Cl. 560—231 **9 Claims**

1. A (1R,cis) compound of the formula



wherein R^1 represents an acetyl group; an alkyl group containing from 1 to 10 carbon atoms optionally substituted by one or more halogen atoms; a (cycloalkyl)alkyl group containing from 3 to 7 ring carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms; a cycloalkyl group containing from 3 to 7 ring carbon atoms; an alkenyl group containing from 2 to 4 carbon atoms optionally substituted by one or more halogen atoms or alkynyl group containing from 2 to 4 carbon atoms or an aryl group containing from 6 to 12 carbon atoms or an aralkyl group containing from 7 to 10 carbon atoms, each optionally ring-substituted by one more halogen atoms; X is $—CH_2C-H(OCH_3)_2$, $—CH_2CHO$, $—CH=CHOR^2$ in which R^2 is an acyl group containing from 1 to 5 carbon atoms, —CHO, —C(O)Cl or —C(O)Br with the proviso that when R' is acetyl then X is not $—CH_2CHO$.

4,518,798
PREPARING ESTERS AND CARBOXYLIC ACIDS FROM LOWER OLEFINS

George M. Kramer; Walter Weissman, both of Berkeley Heights, N.J.; Herbert C. Brown, West Lafayette, Ind., and Rowland Pettit, deceased, late of Austin, Tex. (by Flora H. Pettit, executrix), assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 30, 1982, Ser. No. 428,930

Int. Cl.[3] **C07C** *51/14, 51/145, 67/347*

U.S. Cl. 560—233 **17 Claims**

1. A process for preparing esters or carboxylic acids from an olefin feed comprising between two and four carbon atoms and added alcohol, if esters are being prepared, or water, if carboxylic acids are being prepared, which process comprises the steps of:

(A) reacting said olefin feed with carbon monoxide in the presence of:

(i) a first complex of a Lewis acid with the ester or carboxylic acid, whichever is obtained as the reaction product from step (B), wherein the Lewis acid is characterized as being capable of forming a 1:1 molar complex with water which complex has an acid strength measured by a Hammett Acidity function value, H_o, of at least −8.0, and wherein the molar ratio of Lewis acid to ester or carboxylic acid is from about 1:1 to 2:1;

(ii) a second complex of said Lewis acid with a primary or secondary alcohol, if an ester is being prepared, or with water, if a carboxylic acid is being prepared, wherein the molar ratio of Lewis acid to alcohol or water is from about 1:1 to 2:1, wherein the molar ratio of said first complex to said second complex initially is about 1:1 to 20:1 and wherein the molar ratio of said ester or carboxylic acid to said alcohol or water, respectively, is at all times greater than 1:1; and

(iii) a metal carbonyl compound, wherein the metal is a Group IB transition metal in the first oxidation state and the molar ratio of the metal carbonyl compound to the Lewis acid present is from 1:10 to 1:100,000; and

(B) recovering the reaction product or mixture of products by displacement with a solution of a primary or secondary alcohol in an inert extractant if an ester is being produced or with water in an inert extractant if a carboxylic acid is being produced.

4,518,799
PROCESSES FOR THE PREPARATION OF HYDRATROPIC ACIDS

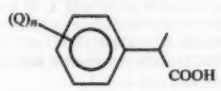
Thomas A. Hylton, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 105,061, Dec. 19, 1979, abandoned. This application Jun. 8, 1982, Ser. No. 386,466

Int. Cl.[3] **C07C** *51/15*

U.S. Cl. 562—423 **12 Claims**

1. A process for the preparation of a compound selected from the group consisting of

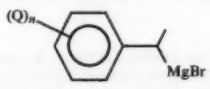


I

in which n is an integer of from 1 to 4, inclusive, and Q_1 is the same or different and is selected from the group consisting of aralkyl, cycloalkyl, alkyl substituted cycloalkyl, cycloalkenyl, aryl, alkoxy, aralkoxy, cycloalkoxy, aryloxy, alkylthio, aralkylthio, cycloalkylthio, arylthio, aryl(dialkoxy)methyl, aryl(alkylenedioxy)methyl, N-alkyl-N-arylamino, trifluoromethyl, fluorine and chlorine, dialkylamino, substituted and unsubstituted pyridyl, piperidyl, furyl, n-alkyl-morpholino, N-alkylthiamorpholino, pyrrolinyl, pyrrolidinyl, pyrrolyl, thienyl, or two Q groups taken together which form a heterocyclic ring, or Q such that together with

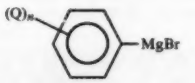
is 9H-carbazol-3-yl or substituted naphthyl, or naphthyl substituted on the 6-position by a moiety selected from the group consisting of alkyl, cycloalkyl, phenyl alkoxy, fluorine and chlorine, which comprises

Step (1) preparing a compound selected from the group consisting of



II

by reacting a compound selected from the group consisting of



III

with ethylene in the presence of an anhydrous nickel catalyst, selected from the group consisting of nickel chloride or nickel (bis)acetylacetonate, which nickel catalyst is pretreated with a reducing agent;

Step (2) carboxylating the Compound II prepared in Step 1 to obtain Compound I.

4,518,800

PROCESS FOR PREPARATION OF CRYSTALLIZED MONOHYDRATED SODIUM PHENYLPYRUVATE

Alain Schouteeten, Ezanville, and Yani Christidis, Paris, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Jul. 13, 1984, Ser. No. 630,427
Claims priority, application France, Jul. 18, 1983, 83 11792
Int. Cl.³ C07C *59/84*
U.S. Cl. 562—459 2 Claims

1. A process for preparation of crystallized monohydrated sodium phenylpyruvate comprising: hot reacting benzaldehyde in an aqueous medium in the presence of a catalytic quantity of ethanolamine with the stoichiometric quantity of hydantoin, then treating the reactional medium hot at pH=14 through an excess of sodium hydroxide, acidifying to pH=9 with concentrated hydrochloric acid the so obtained solution and separating the formed precipitate.

4,518,801

PROCESS FOR THE HYDROLYSIS OF 5-(β-METHYLMERCAPTOETHYL)-HYDANTOIN

Rudolf Bolze, Grünaustrasse 11, 6450 Hanau 9; Friedhelm Geiger, Kurt-Schumacher-Strasse 30 a, 6455 Erlensee; Manfred Spindler, Kurfurstenstrasse 24, 6450 Hanau 1, and Herbert Tanner, Wildaustrasse 20, 6450 Hanau 9, all of Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,136
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335218
Int. Cl.³ C07C *149/247*
U.S. Cl. 562—559 16 Claims

1. In a process for the hydrolysis of 5-(β-methylmercaptoethyl)-hydantoin at elevated temperature and pressure in an aqueous alkaline medium, the improvement comprising carrying out the hydrolysis in a reaction solution comtaining 0.5 to 3 equivalents of at least one alkali metal hydroxide, alkali metal carbonate, alkali metal hydrogen carbonate or a mixture thereof based on the amount of hydantoin in the presence of excess ammonia.

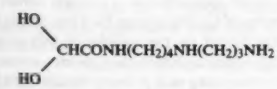
4,518,802

N-[4-[(3-AMINOPROPYL)AMINO]BUTYL]-2,2-DIHYDROXYETHANAMIDE

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Hironobu Iinuma; Daishiro Ikeda, both of Tokyo; Teruya Nakamura, Kusatsu, and Akio Fujii, Kamakura, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation of Ser. No. 375,916, May 7, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,563
Claims priority, application Japan, May 18, 1981, 56-73510
Int. Cl.³ C07C *103/16*
U.S. Cl. 564—201 2 Claims

1. A compound selected from the group consisting of N-[4-[(3-aminopropyl)amino]butyl]-2,2-dihydroxyethanamide of the formula (I)



I

and an acid addition salt thereof.

4,518,803

PROCESS FOR THE PREPARATION OF P-NITROSODIPHENYLAMINE

Wadim Batorewicz, New Haven, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,100
Int. Cl.³ C07C *76/00, 85/11*
U.S. Cl. 564—410 12 Claims

1. A process for the preparation of p-nitrosodiphenylamine hydrochloride comprising reacting diphenylamine, C_5–C_{10} alkyl nitrite and anhydrous HCl in the presence of a C_5–C_{10} aliphatic alcohol, essentially in the absence of an inert solvent and wherein the alkyl group of the alkyl nitrite has the same number of carbon atoms as said aliphatic alcohol.

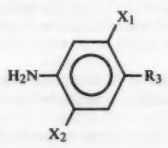
4,518,804

HALO(ALKOXY/ALKYLTHIO)-BENZENAMINES

Raymond H. Rigterink, Midland, Mich., and Barat Bisabri-Ershadi, Pittsburg, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 401,492, Jul. 26, 1982,. This application Aug. 3, 1983, Ser. No. 520,032
Int. Cl.³ C07C *87/60, 149/42*
U.S. Cl. 564—442 3 Claims

1. A compound having the formula



wherein X_1 and X_2 are independently halogen and R_3 is a C_1–C_4 haloalkoxy or haloalkylthio group.

4,518,805

PROCESS FOR REMOVING HYDROPEROXIDES AND ALDEHYDES FROM ALLYL-ALKYL ETHER

Anthony G. Abatjoglou, and David R. Bryant, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 243,082, Mar. 12, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,023
Int. Cl.³ C07C *45/50*
U.S. Cl. 568—444 4 Claims

1. In a rhodium catalyzed hydroformylation process for producing an ether aldehyde by reacting an allyl-alkyl ether feedstock with carbon monoxide and hydrogen, said allyl-alkyl ether being selected from the group consisting of allyl tert-butyl ether, allyl 2,3-dimethylbut-2-yl ether, allyl 2-methylbut-2-yl ether, allyl 3-methylpent-3-yl ether, allyl 3-ethylhex-3-yl ether, allyl 5-propylnon-5-yl ether, allyl 1-methylcyclohexyl ether, and allyl 1-methylcyclopentyl ether, the improvement which comprises employing as the allyl-alkyl feedstock, an allyl-alkyl ether feedstock which has been treated with sodium borohydride in alkaline aqueous solution to form an organic containing layer which is separated under an inert gas blanket and washed with degassed water, so as to convert hydrogen peroxide present in said allyl-alkyl ether feedstock to decomposition products, including α,β-unsaturated aldehydes, and reduce such α,β-unsaturated aldehydes to alcohols.

4,518,806

PRODUCTION OF ARYL ALKYL ETHERS FROM METHYLBENZYL ALCOHOL USING BIS-(DITHIOBENZYL)NICKEL(II) CATALYST

Haven S. Kesling, Jr., Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 1, 1983, Ser. No. 510,023
Int. Cl.³ C07C *41/09*
U.S. Cl. 568—659 **11 Claims**

1. An improved process for the catalytic preparation of bis alpha-methylbenzyl ether from alpha-methylbenzyl alcohol in the presence of a catalyst wherein the improvement comprises contacting said alpha-methylbenzyl alcohol with a bis alpha-(dithiobenzyl)nickel(II) catalyst.

4,518,807

PROCESS FOR THE PRODUCTION OF BASIC ALKALINE EARTH METAL PHENATES

Takashi Hori; Sanae Ueda, both of Saitama, and Yoshihiro Kojima, Ibaraki, all of Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Aug. 10, 1983, Ser. No. 521,811
Claims priority, application Japan, Aug. 16, 1982, 57-142393
Int. Cl.³ C07C *39/00, 39/04*
U.S. Cl. 568—716 **22 Claims**

1. A process for producing a basic alkaline earth metal phenate, comprising the steps of:

providing reactants comprised of a mixture of a phenol, a dihydric alcohol, and an alkaline earth metal agent selected from the group consisting of alkaline earth metal oxides and hydroxides, said dihydric alcohol being in an amount of at least 0.15 mol per mol of the alkaline earth metal agent, and said alkaline earth metal agent being in an amount of from 0.001 to 20 equivalents per equivalent of the phenol;

allowing the reactants to react and achieve addition of the metal to the phenol at a temperature of from 60° C. to 200° C.;

adding water to the reactants while they are allowed to react, the water being added in an amount of from 0.01 to 10 mols per mol of the alkaline earth metal agent; and

thereafter treating the metal addition reaction product with carbon dioxide at a temperature of from 50° C. to 230° C.

4,518,808

PREPARATION OF 2,5-DICHLOROHYDROQUINONE

Richard H. S. Wang, and Garry L. Myers, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,227
Int. Cl.³ C07C *37/62*
U.S. Cl. 568—765 **1 Claim**

1. Process for the preparation of 2,5-dichlorohydroquinone which comprises reacting hydroquinone with sulfuryl chloride in a mole ratio of about 2.0 to 2.2 mole of sulfuryl chloride per mole of unchlorinated compound at a temperature of about 60° to 100° C. in the presence of acetic acid, propionic acid or a lower alkyl ester thereof.

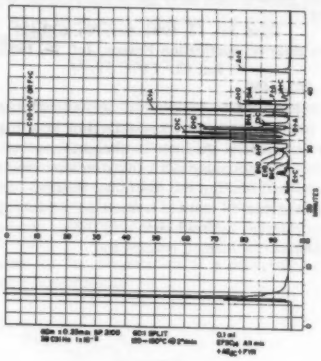
4,518,809

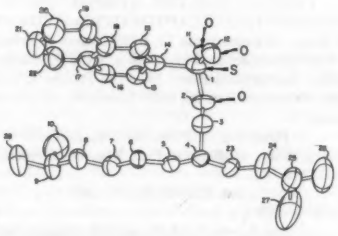
PREPARATION OF PENTYL NONANOLS

Denis Forster, St. Louis, and George F. Schaefer, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 272,587, Jun. 11, 1981, Pat. No. 4,426,542, which is a continuation-in-part of Ser. No. 256,439, Apr. 22, 1981, abandoned, which is a continuation of Ser. No. 104,517, Dec. 17, 1979, abandoned. This application Jun. 1, 1983, Ser. No. 499,967
Int. Cl.³ C07C *31/125*
U.S. Cl. 568—840 **17 Claims**

1. A mixture of C_{14} isomeric alcohols which are characterized as nine-carbon alkanol with a five-carbon alkyl group substituted on the 2-position thereof, and with additional branching in most of the isomers, with most of the additional branches being methyl groups, and further characterized as liquid at ambient temperature and having varying hydrocarbon hydrophobe moieties making the mixture suitable for formation of effective detergents therefrom, and further characterized by suitable biodegradability, alcohols further characterized in that the isomers are in proportions attainable from aldol and hydrogenation reactions of a C_7 aldehyde obtained by oxo reaction of propylene dimers.





4,518,810

PROCESS FOR PREPARATION OF GUERBET ALCOHOLS

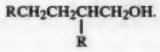
Morio Matsuda, and Masamitsu Horio, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 473,918
Claims priority, application Japan, Mar. 18, 1982, 57-43370
Int. Cl.³ C07C *29/34*
U.S. Cl. 568—905 **4 Claims**

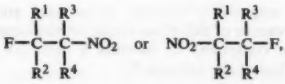
1. A process for preparing a branched dimerized alcohol, which comprises: heating a primary alcohol having the formula

$$RCH_2CH_2OH$$

in which R is alkyl having 1 to 24 carbon atoms, at a reaction temperature in the range of from 200° to 230° C., in the presence of from 0.25 to 5% by weight of potassium hydroxide and from 0.005 to 0.2% by weight of a co-catalyst consisting essentially of copper and nickel supported on a catalyst carrier and wherein the weight ratio of Cu/Ni is from 85/15 to 50/50, both said percentages being based on the weight of said primary alcohol, and removing water, as it is formed, from the reaction mixture, and thereby converting said primary alcohol, at a high yield and a high selectivity, to a branched dimerized alcohol having the formula



in which
R^1, R^2, R^3 and R^4 each independently is hydrogen, fluorine, chlorine, bromine, alkyl, halogenoalkyl or cycloalkyl, or R^2 and R^4 together are an alkylene radical of 3 to 6 carbon atoms,
with hydrogen fluoride and nitric acid to produce an α-fluorinated nitroalkane of the formula



the improvement which comprises effecting the reaction in a vessel protected against corrosion employing about 1 to 1.1 mols of hydrogen fluoride and about 1 to 2 mols of nitric acid per mol of olefin.

11. An α-fluoronitroalkane selected from the group consisting of
2,2-difluoronitroethane,
2,2-dichloro-2-fluoro-1-methylnitroethane,
2-chloro-2,2-difluoro-1-methylnitroethane,
2,2-difluoronitropropane and
2-chloro-2,2-difluoronitroethane.

4,518,811
REACTOR FOR NITRATION OF HYDROCARBONS IN THE GASEOUS PHASE UNDER PRESSURE

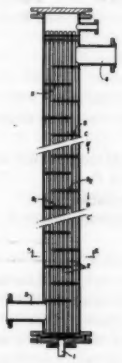
Pierre Lhonoré, Douai; Jacques Quibel, Maisons Lafitte; Bernard Jacquinot, Douai; Yvon Jestin, Rueil Malmaison, and Robert Pelletier, Paris, all of France, assignors to Societe Chimique de la Grande Paroisse - Azote et Products Chimiques, Paris, France

Division of Ser. No. 278,004, Jul. 6, 1981, Pat. No. 4,450,140, which is a continuation-in-part of Ser. No. 131,004, Mar. 17, 1980, abandoned. This application Sep. 15, 1983, Ser. No. 533,049

Claims priority, application France, Mar. 28, 1979, 79 07840

Int. Cl.³ C07C *76/02*

U.S. Cl. 568—943 **11 Claims**



1. A process for nitrating a gaseous mixture of saturated hydrocarbons of less than five carbon atoms, in an enclosure comprising the steps of:
conducting a heat-carrying fluid of high heat-exchange capacity through said enclosure;
distributing said mixture homogeneously to a tube bank disposed in contact with said heat-carrying fluid; and
conducting said mixture through said tube bank.

4,518,812
PROCESS FOR THE PREPARATION OF FLUORINATED NITROALKANES

Bernd Baasner; Hermann Hagemann, both of Leverkusen, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1984, Ser. No. 575,636

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305202

Int. Cl.³ C07C *76/02, 79/02*

U.S. Cl. 568—946 **11 Claims**

1. In the conjugated nitrofluorination of an olefin by reacting an olefin of the formula

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4,518,813
OPTICALLY ACTIVE UNITS FOR THE SYNTHESIS OF THE SIDE CHAIN OF (R,R,R)-α-TOCOPHEROL AND THEIR PREPARATION

Hansgeorg Ernst, Ludwigshafen; Friedrich Vogel, Wachenheim, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,695

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139238

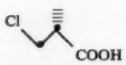
Int. Cl.³ C07C *17/16, 17/26, 19/02*

U.S. Cl. 570—241 **4 Claims**

1. A process for the preparation of (2R,6R)-1-chloro-2,6,10-trimethylundecane of the formula

(I)

which comprises:
(a) reducing (R)-(+)-β-chloroisobutyric acid of the formula II



(II)

with a boron hydride reducing agent or lithium aluminum hydride to give (R)-(−)-3-chloro-2-methylpropanol of the formula III

(III)

(b) brominating the compound of formula III with phosphorus tribromide, with triphenylphosphine and bromine in dimeth-

ylformamide, or with triphenylphosphine and carbon tetrabromide in methylene chloride to give (S)-(+)-1-bromo-3-chloro-2-methylpropane of the formula IV

(IV)

(c) converting the compound of formula IV into (2R)-(+)-1-chloro-2,6-dimethylheptane of the formula V

(V)

with isopropyl magnesium bromide in an inert ethereal solvent in the presence of a di-alkali-metal tetrahalocuprate,

(d) converting the compound of formula V into (3R)-3,7-dimethyl-octan-1-ol of the formula VI

(VI)

by treatment with metallic magnesium in ethereal solution and subsequent introduction of gaseous formaldehyde,

(e) brominating the compound of formula VI with phosphorus tribromide, with triphenyl phosphine and bromine in dimethylformamide, or with triphenylphosphine and carbontetrabromide in methylene chloride to give (3R)-1-bromo-3,7-dimethyloctane of the formula VII

(VII)

(f) converting the compound of formula VII, by treatment with metallic magnesium, into the corresponding Grignard compound, and

(g) reacting the Grignard compound with (S)-(+)-1-bromo-3-chloro-2-methylpropane in an ethereal solvent in the presence of a di-alkali-metal tetrahalocuprate to give the compound of formula I.

4,518,814

ETHYLENE OLIGOMERATION

Ronald D. Knudsen, and Stephen E. Reiter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

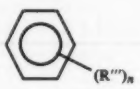
Division of Ser. No. 490,596, May 2, 1983, Pat. No. 4,482,640. This application Aug. 24, 1984, Ser. No. 644,080

Int. Cl.[3] **C07C** *2/02*

U.S. Cl. 585—523 **6 Claims**

1. An improved process for the oligomerization of ethylene comprising contacting said ethylene with a catalyst composition in the liquid phase present in at least one solvent selected from the groups consisting of:

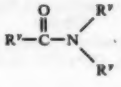
(i) an aromatic hydrocarbon of the formula



wherein R''' represents a C_1 to C_6 alkyl radical and n is 0, 1, 2, 3, or 4;

(ii) an alcohol of the formula $(R^{iv})_3COH$ wherein R^{iv} independently represents H or a C_1 to C_{12} alkyl, cycloalkyl, aryl, alkaryl, or aralkyl radical with the proviso that at least one R^{iv} is not hydrogen;

(iii) an amide of the formula



wherein each R^v independently represents H or a C_1 to C_{10} alkyl, cycloalkyl, aryl, aralkyl, or alkaryl radical with the proviso that at least one R^v is not H;

(iv) a C_2 to C_{20} ether;

(v) a C_2 to C_{20} ester;

(vi) a C_3 to C_{20} ketone;

(vii) a C_2 to C_{20} nitrile; and

(viii) a C_6 to C_{20} chlorinated aromatic, the catalyst consisting essentially of:

(a) at least one nickel compound selected from the group consisting of:

bis(1,5-cyclooctadiene)nickel(O);

bis(tricyclohexylphosphine)nickel(O);

nickel tetracarbonyl;

(cyclododecatriene)nickel; and

bis(ethylene)(dicyclohexylphosphine)nickel;

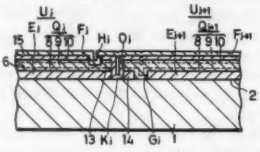
(b) a phosphine compound of the formula PR_3 wherein R independently represents H or a C_1 to C_{20} hydrocarbyl radical with the proviso that any alkenyl substitution be at least 3 carbon atoms removed from the phosphorus atom and at least one R is not H; and

(c) an acid selected from the group consisting of (i) a fluorinated carboxcyclic acid of the formula R'COOH wherein R' represents a C_1 to C_{10} hydrocarbyl radical having at least 1 fluorine (F) atom, (ii) a dicarboxcyclic acid of the formula $(R'')_2—X—(COOH)_2$ wherein R'' independently represents H or a C_1 to C_{20} hydrocarbyl or fluorinated hydrocarbyl radical and X is a tetravalent C atom or the tetra-substituted benzene radical C_6H_2; (iii) 2-ketobutyric acid and (iv) glycine, such that the molar ratio of (b) to (a) is about 0.01–4.0 to 1 and the molar ratio of (c) to (a) is about 0.01–10.0 to 1 at a temperature of from about 0° C. to about 200° C.

4,518,815
PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 555,317
Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—244 11 Claims



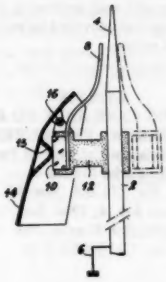
1. A photoelectric conversion device comprising:
a substrate having an insulating surface; and
a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another;
wherein the semiconductor element U_i (i=1, 2, . . . n) has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;
wherein the second electrode F_{j+1} (j=1, 2, . . . (n−1)) of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semicondutor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1};
wherein the first electroes E_j and E_{j+1} are separated by a first groove G_j;
wherein the second electrode F_{j+1} extends on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;
wherein the second electrodes F_j and F_{j+1} are separated by an isolating portion H_j in the non-single-crystal semiconductor laminate member Q_i;
wherein a second groove O_j is cut in the non-single-crystal semiconductor laminate member Q_i between the second electrode F_{j+1} and the first electrode E_j to extend into the latter; and
wherein the coupling portion K_j extends into the second groove O_j to be coupled with the side of the first electrode E_j exposed to the second groove O_j.

4,518,816
LIGHTNING CONDUCTOR WITH PIEZOELECTRIC DEVICE FOR INITIATING THE CORONA EFFECT

Andre Robert, Le Mesnil Saint Denis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 23, 1984, Ser. No. 592,702
Claims priority, application France, Mar. 25, 1983, 83 04947
Int. Cl.³ H02G *13/00*; H01T *1/20, 19/00*
U.S. Cl. 174—3 4 Claims

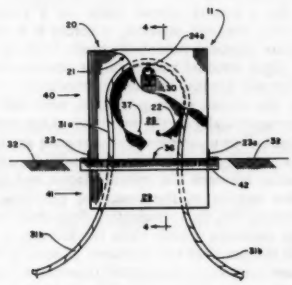
1. A lightning conductor with a device for initiating the corona effect incorporating a metal rod terminated by a tip and connected to the ground by an electric conductor, wherein it also comprises at least one electrode, whereof one end is in the vicinity of the rod tip, at least one piezoelectric crystal electrically connected to at least one electrode, and a means for exerting a mechanical pressure on said piezoelectric crystal.



4,518,817
BURIED CONDUCTOR CABLE ENERGY DISTRIBUTION SYSTEM WITH CONDUCTOR LOOP ENCLOSURE

James R. Kirby, 406 Lewes Cir., Columbia, S.C. 29210, and Donald F. Looney, P.O. Box 685, Irmo, S.C. 29063

Filed Feb. 22, 1983, Ser. No. 468,366
Int. Cl.³ H02G *9/10*
U.S. Cl. 174—38 25 Claims



1. A conductor loop enclosure for enclosing a loop of an underground flexible energy conductor buried beneath the ground-plane, which loop extends above the ground-plane at a selected location, comprising:
(a) an enclosing structure for insertion about a conductor loop having an open front above-ground-plane portion and an open bottom below-ground-plane portion for extending a predetermined distance below said ground-plane;
(b) movable cover means to close off said open front of said enclosing structure;
(c) hoop means within said enclosing structure having a depth substantially equal to the inside depth of said enclosing structure on which a loop is to be placed in a freely movable mode for its support and on which hoop means a loop will be completely captured within said enclosing structure when said cover means is in place thereby holding said enclosing structure fixed in place by the combined anchoring effect of a conductor loop of a buried conductor; and,
(d) feet means attached to said enclosing structure at the junction of the above-ground-plane portion and the below-ground-plane portion of said enclosing structure

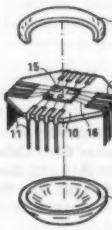
arranged so as to both correctly locate said enclosing structure with respect to said ground-plane and to provide a greater area to distribute the load of the combined weight of a loop and said enclosing structure over said ground-plane than that provided by an enclosing structure without said feet means.

4,518,818

ENCAPSULATING CASE ABLE TO RESIST HIGH EXTERNAL PRESSURES

Jacques Le Ny, and Christian Val, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 274,205, Jun. 16, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 557,256
Claims priority, application France, Jun. 19, 1980, 80 13596
Int. Cl.³ H05K *5/06*
U.S. Cl. 174—52 FP **7 Claims**



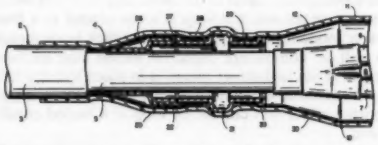
1. An encapsulating case which is able to resist high external pressures for a hybrid circuit made on a planar substrate formed from a ceramic material, wherein it is firstly constituted by two identical half-shells made from an electrically insulating, rigid material and having a convex shape with no sharp angles and having an internal concavity of dimensions adapted to the circuit to be protected, said half-shells being arranged symmetrically on the two faces of the substrate of the hybrid circuit, thus creating within the case an unpressurized area with a zero deformation and secondly by electrical connection means between the hybrid circuit and external connecting pins outside of the case, the electrical connection means including flat, thin conductors deposited on at least one face of the substrate which have thicknesses in the micron range to be thinner than the thickness pf sealing joints so that the electrical connection means will traverse the encapsulating case in the thickness of the sealing joint to be in the plane of the sealing joint of one half-shell on the substrate.

4,518,819

CLAMP ASSEMBLY FOR POWER CABLES

Peter L. Larsson, Mountain View, and Robin J. T. Clabburn, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 288,427, Jul. 30, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 532,081
Int. Cl.³ H02G *15/08, 1/14*
U.S. Cl. 174—78 **22 Claims**



1. An assembly for connecting the metal armor, screen or shielding of a power cable to a metal bridging element which spans a joint between the power cable and at least one other power cable, the power cable comprising a core, a sheath surrounding said core, metal armor, screen or shielding surrounding the sheath and an outer insulating layer; said assembly comprising:

(a) a hollow metal cylinder having two end portions and a center portion, said cylinder having an internal diameter greater than the diameter of said cable, said center portion having an outer diameter greater than the outer diameter of said end portions, and said cylinder being of a length insufficient to span the joint;

(b) means for sealing one end portion of said cylinder to the sheath surrounding the core of said cable;

(c) a first clamping means for securing the metal armor, screen or shielding to one of said end portions of said cylinder; and

(d) a second clamping means for securing one end of said metal bridging element to the other of said end portions of said cylinder.

10. A method for connecting the metal armor, screen or shielding of a power cable to a metal bridging element which spans a joint between the power cable and at least one other power cable, the power cable comprising a sheath surrounding said core, metal armor, screen or shielding surrounding the sheath and an outer insulating layer; said method comprising:

(a) positioning over the end of said cable, a metal cylinder having two end portions and a center portion, said cylinder having an internal diameter greater than the said diameter of said cable, said center portion having an outer diameter greater than the outer diameter of said end portions, and said cylinder being of a length insufficient to span the joint;

(b) sealing said cylinder to the sheath surrounding the core of said cable;

(c) clamping said metal armor, screen or shielding to one of said end portions of said cylinder; and

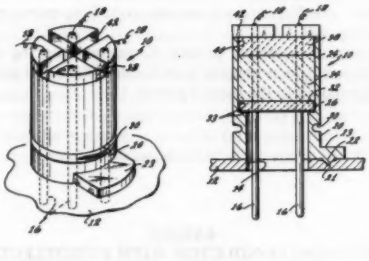
(d) clamping one end of said metal bridging element to the other of said end portions of said cylinder; the metal armor screen or shielding and said metal bridging elements being positioned such that they do not cover the center portion of said cylinder.

4,518,820

TERMINAL ASSEMBLY FOR HEART PACEMAKERS

James C. Kyle, 2547 Fisher Rd., Roseburg, Oreg. 97470

Filed Nov. 4, 1982, Ser. No. 439,048
Int. Cl.³ H01B *17/26*
U.S. Cl. 174—152 GM **24 Claims**



14. In combination,

a lid,

a hollow ferrule attached to the lid and having a heat sink and being adjustable in position upon the introduction of heat to the ferrule to attach the ferrule to the lid,

a terminal pin extending through the ferrule and the lid in spaced relationship to the ferrule and the lid,

first insulating means disposed in the ferrule for providing for an adjustment in the position of the ferrule without the introduction of heat to the ferrule, and

second insulating means disposed in the ferrule and hermetically sealed to the first insulating means, the terminal pin and the ferrule.

4,518,821

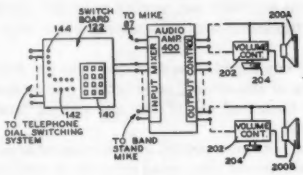
RESTAURANT TELEPHONE ENTERTAINMENT SYSTEM

Seymour C. Yuter, 407 Cedar Dr. West, Briarcliff Manor, N.Y. 10510

Continuation of Ser. No. 173,037, Jul. 28, 1980, abandoned, which is a continuation of Ser. No. 013,568, Feb. 21, 1979, abandoned. This application Feb. 18, 1983, Ser. No. 467,495

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—2 R **8 Claims**



1. A restaurant telephone entertainment system for a restaurant having a plurality of at least four tables comprising:

(A) a plurality of at least four telephones, with each of said telephones associated with one of said plurality of tables;

(B) a plurality of at least four speakers, with each of said speakers associated with one of said plurality of telephones;

(C) audio amplifier means having its output coupled to each of said plurality of speakers for feeding amplified input signals to each of said plurality of speakers; and

(D) telephone switching means having its input responsive to telephone conversation audio signals generated between two of said telephones and its output coupled to the input of said audio amplifier means;

(E) said audio amplifier means having means for amplifying and feeding said telephone conversation audio signals to at least two speakers other than the two speakers associated with the two telephones generating said telephone conversation audio signals.

4,518,822

METHOD AND APPARATUS FOR AUTOMATICALLY ESTABLISHING TELEPHONE COMMUNICATION LINKS

Louis Martinez, Carson, Calif., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Division of Ser. No. 250,779, Apr. 3, 1981, Pat. No. 4,415,771. This application Mar. 8, 1983, Ser. No. 472,869

Int. Cl.³ H04H *11/08*

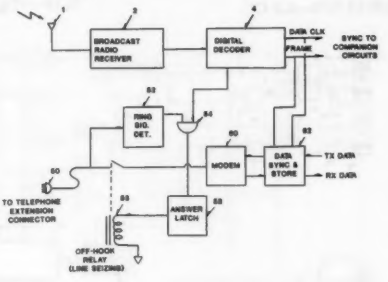
U.S. Cl. 179—2 E **14 Claims**

1. Apparatus for establishing a telephone communications link between a calling location and a remote location comprising

a central transmitter station including first transmitter modulation means for modulating a signal to be transmitted with programming, using a first modulation technique, for transmission of the programming to manually controllable first receivers having first receiver demodulation means responsive to signals modulated with said first modulation technique for the reception and demodulation of said modulated signal to allow selective perception of the programming by members of the public,

second modulation means coupled to said central transmitter station for modulation of the signal to be transmitted with a request to answer signal utilizing a second modulation technique to which said first receiver demodulation means are not primarily responsive,

at least one second receiver, each of said second receivers having second receiver demodulation means responsive to signals modulated with said second modulation technique for the reception and demodulation of the transmitted signal to provide the request to answer signal at the respective remote location,



phone control means coupled to each of said second receivers for receiving said request to answer signal and for providing a phone control signal in response thereto, and

phone answering means coupled to each of said phone control means and a phone line and being responsive to said phone control signal and a ring signal on the phone line to automatically terminate the ring signal and hold the phone line upon receipt of a call.

4,518,823

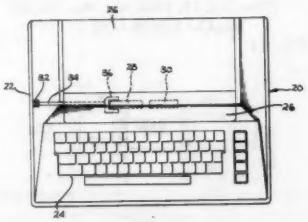
MODEM CARTRIDGE AND CONNECTION FOR PROGRAM CARTRIDGE TYPE COMPUTERS

Bayard F. Kessler, Woodland Hills, Calif., assignor to Novation, Inc., Chatsworth, Calif.

Filed Oct. 6, 1983, Ser. No. 539,648

Int. Cl.³ H04L *5/00*

U.S. Cl. 179—2 DP **12 Claims**



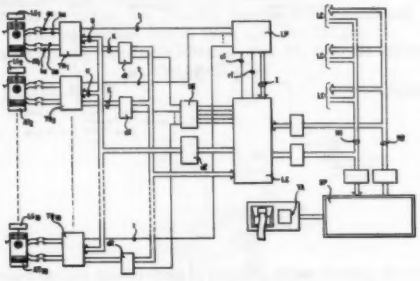
12. Modem apparatus for program cartridge type computers having at least one cartridge receptacle for receiving and electrically connecting to program cartridges, each of a predetermined mechanical and electrical connection configuration, comprising a modem cartridge containing a modem, and having said predetermined electrical connection configuration and a mechanical configuration so as to be receivable in said cartridge receptacle to electrically connect said modem and said computer, said modem cartridge further having a modular connector cooperatively disposed on said modem cartridge so as to be connectable with a phone line when said modem cartridge is inserted into said cartridge receptacle.

4,518,824

PUBLIC TELEPHONE METHOD AND APPARATUS WHEREIN THE USER'S PERSONAL TELEPHONE NUMBER AND A PERSONAL DIALING CODE ARE USED TO EFFECT DEBITING CHARGES

Massimo Mondardini, Turin, Italy, assignor to Urmet Sud S.P.A., Rome, Italy

Filed Jun. 7, 1982, Ser. No. 386,159
Claims priority, application Italy, Jun. 9, 1981, 67787 A/81
Int. Cl.³ G06K *5/00*; H04M *17/02*
U.S. Cl. 179—6.3 CC **8 Claims**



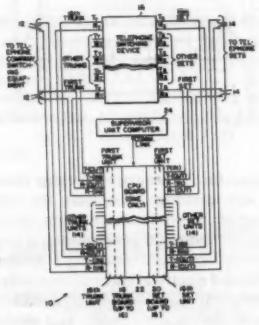
1. A public telephone method comprising the steps of validation of an identification card by a reader associated to a public telephone set, in which said card has been inserted by a user, reading information data from the identification card by said reader, reception of signals of a dialling operation of a personal code performed by the user on a selection device of said public telephone set, transmitting by said public telephone set the information data read and said dialled personal code to a centralized logic system, ascertaining the functional mating between said information data and said personal code by the centralized logic system and enabling said public telephone set for the making of a call by the user, and debiting through said centralized logic system said call to a selected telephone number counter.

4,518,825

TELEPHONE INTERCONNECT DETECTION SYSTEM

Jesse R. Brinkerhoff, and Richard S. Brinkerhoff, both of King County, Wash., assignors to Telecalc, Inc., Bellevue, Wash.

Filed Oct. 11, 1983, Ser. No. 540,991
Int. Cl.³ H04M *3/36, 15/34*
U.S. Cl. 179—11 **20 Claims**



1. A system for selectively determining, during operation, interconnect of a plurality of first telephone lines with a plurality of second telephone lines interconnected by a switching device, one of said plurality of first or second lines being telephone system trunk lines and the other being telephone set lines, and said switching device being a pbx or the like, said system comprising:

means for selecting in sequential order ones of said first lines according to a predetermined logic, and generating operation signals;

a pulse generator for generating a sensing pulse within the audio bandwidth of said switching device;

means for selectively applying one of said sensing pulses to one of said selected first lines in response to said operation signals for transmission of said one sensing pulse through said switching device;

a selectively operable first filter connected to said first lines, said first filter being operable in response to said operation signals to attenuate said sensing pulse for inhibiting outbound transmission of said sensing pulse over said first lines;

a detector connected to said second lines for detecting the presence of said sensing pulse on any one or more of said second lines, and identifying said one or more second lines; and

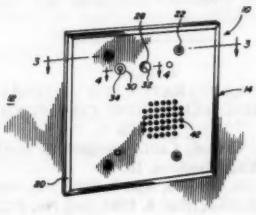
a selectively operable second filter connected to said second lines, said second filter being operable in response to said operation signals to attenuate said sensing pulse for inhibiting outbound transmission of said sensing pulse over said second lines.

4,518,826

VANDAL-PROOF COMMUNICATION SYSTEM

Eddie T. Caudill; Richard T. Caudill, and Lyle N. Conley, all of Albuquerque, N. Mex., assignors to Mountain Systems, Inc., Albuquerque, N. Mex.

Filed Dec. 22, 1982, Ser. No. 452,094
Int. Cl.³ H04M *1/04*
U.S. Cl. 179—37 **7 Claims**

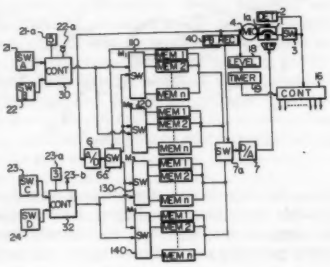


1. In a mounting assembly for an intercom station having separate and spaced switch, lamp and transducer devices associated therewith, the mounting assembly including a common protective plate supporting all of said devices on a wall, said plate having an exposed surface through which sound transmitting openings extend in operative alignment with the transducer device, the improvement residing in means for rendering the station vandal-resistant, comprising means for embedding the switch and lamp devices in the protective plate, said transducer device having a driver unit and an exponential horn, said horn having a small input end connected to the driver unit and a large output end, and means mounting the horn rearwardly on the plate with the output end thereof in alignment with the sound transmitting openings for spacing the input end of the horn in lateral, non-overlapping relation to said openings.

4,518,827
TELEPHONE ANSWERING AND MESSAGE RECORDING SYSTEM

Iwao Sagara, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,910
Claims priority, application Japan, Oct. 5, 1981, 56-157602
Int. Cl.³ H04M *3/50, 11/10*
U.S. Cl. 179—81 R 6 Claims



1. A telephone answering and message recording apparatus coupled with a subscriber telephone set and suitable for installation with individual subscriber telephone sets of a telephone system, comprising:

a microphone (**4**) and a speaker (**5**);

an analog-digital converter (**6**) for converting an input analog speech to a digital signal, the input of said converter (**6**) being coupled with said microphone (**4**) or a telephone line;

a plurality of groups (M_1, M_2, M_3, M_4,) of semiconductor memories, each group having a plurality of memory cells for recording and reproducing predetermined local speech and speech of a remote caller;

a group selection switch (**6***a*) coupled with the output of said analog-digital converter (**6**) to select one of the groups;

a cell selection switch (**110, 120, 130, 140**) coupled with the output of said group selection switch (**6***a*) to select one of the memory cells in each selected group;

an output switch (**7***a*) coupled with the outputs of the memories of each of the groups to select one of the groups;

a PB receiver (**40**) coupled with the output of said microphone (**4**) for detecting a PB code to control said group selection switch (**6***a*), said output switch (**7***a*), and said cell selection switch (**110, 120, 130, 140**) according to the detected PB code;

a digital-analog converter (**7**) coupled with the output of said output switch (**7***a*), and the output of said digital-analog converter (**7**) being coupled with said speaker (**5**);

a call detector (**2**) to detect reception of a telephone call to initiate the operation of the present apparatus;

a plurality of manual switches (**21, 22, 23, 24**) for handling each group (M_1, M_2, M_3, M_4) of memories,

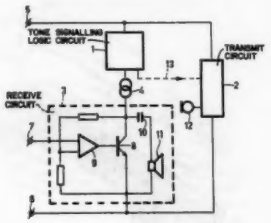
means (**16**) for controlling the operation of the apparatus according to a predetermined sequence; and

a level detector (**18**) coupled with said microphone (**4**) to detect that the speech level is lower than a predetermined level, and a timer (**19**) to determine that the duration that the speech level is lower than the predetermined level continues longer than a predetermined duration, in order to detect the finish of speech of a remote caller and to implement the beginning of local speech recording in one of said semiconductor memories.

4,518,828
TRANSMISSION CIRCUIT FOR AN ELECTRONIC TELEPHONE SET

Josephus J. A. Geboers, and Daniël J. G. Janssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,717
Claims priority, application Netherlands, Feb. 19, 1982, 8200666
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—81 R 3 Claims

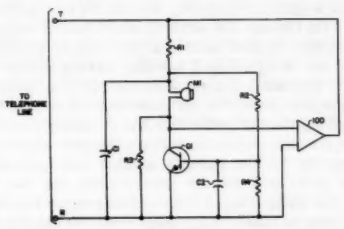


1. A transmission circuit for an electronic telephone set comprising a receive circuit, a transmit circuit, and a logic circuit for generating tone signals; said logic circuit being in series arrangement with said transmit circuit for such tone signals and forming a series arrangement with said receive circuit for direct current; and for direct current said transmit circuit being connected in parallel with said direct current series arrangement of said logic circuit and said receive circuit.

4,518,829
TWO TERMINAL MICROPHONE ACTIVE LOAD GAIN REGULATION CIRCUIT

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communications Systems Corporation, Northlake, Ill.

Filed Apr. 2, 1984, Ser. No. 596,179
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—81 B 8 Claims



1. A gain regulation circuit employing an active load for an electret microphone included in a subscriber telephone instrument connected to a telephone line extending to a central switching point and including a power source thereat connected to said telephone line, said regulation circuit comprising:

an active load circuit connected in series with said electret microphone across said telephone line;

bias means for said active load circuit connected across said telephone line and including a circuit connection to said active load circuit;

an amplifier means including an input connected to the junction between said electret microphone and said active load circuit, and an output connected to said telephone line.

4,518,830

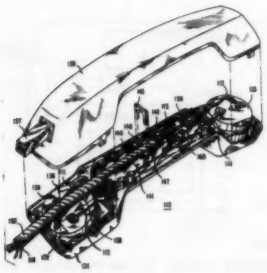
ARMORED TELEPHONE CORD WITH A LONGITUDINAL STRENGTH MEMBER

Leonard H. Drexler, Carmel; Richard M. Flynn, Indianapolis, both of Ind.; George R. Fox, Holmdel; Herbert C. Illium, Jr., Ocean, both of N.J., and Robert J. O'Connor, Greenfield, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1982, Ser. No. 392,002

Int. Cl.³ H04M *1/15, 1/03;* **H04R** *1/06*

U.S. Cl. 179—103 **16 Claims**



12. A telephone handset cord comprising a flexible armored sheath having disposed in its interior and extending throughout its length both a plurality of conductors and a strength member for providing tensile strength between a telephone handset and a telephone housing, the strength member being secured at one end inside the telephone handset and at the other end inside the telephone housing, and wherein the telephone handset comprises a transmitter portion, a receiver portion, and a tapered yoke portion interposed between the transmitter and the receiver portions, and means for securing the strength member in the handset, the strength member comprising a flexible cable having a first diameter with a cylindrically shaped end termination, the end termination being axially aligned with the cable and having a second larger diameter, a catch surface being provided by the larger diameter of the end termination forming a shoulder at the common attachment point of the end termination and the flexible cable, and the strength member being longer in length and extending beyond the end section of the sheath in the handset, the securing means further comprising a wedge-shaped member located in the receiver portion of the handset, the wedge-shaped member having axially aligned slots of a first and a second diameter, the first diameter slot defining a passageway for the cable and the second diameter slot receiving the end termination and providing a stop surface therefor, the yoke portion including a chamber which provides a passageway for the strength member and expands at the common point between the yoke portion and the receiver portion, the wedge-shaped member being secured in the handset by having its tapered edge project into the expanded chamber in the yoke portion of the handset, the interaction between the stop surface of the wedge-shaped member and the catch surface of the cylindrically shaped member providing the longitudinal tensile strength in the securing of the cord to the handset.

4,518,831

TRANSDUCER WITH TRANSLATIONALLY ADJUSTABLE ARMATURE

W. Kent Stanley, and George C. Tibbetts, both of Camden, Me., assignors to Tibbetts Industries, Inc., Camden, Me.

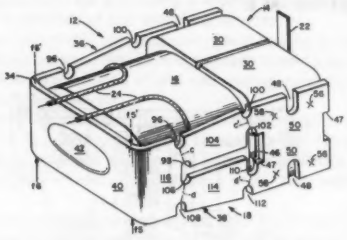
Filed Nov. 4, 1983, Ser. No. 548,838

Int. Cl.³ H04R *11/00*

U.S. Cl. 179—119 A **14 Claims**

1. An electromechanical transducer having in combination, polarizing flux means comprising at least one permanent magnet and a pair of spaced, facing pole surfaces defining a gap, and

armature means comprising a flux conductive armature leg extending into the gap, and an adjustable support arm fixed to the armature leg remote from the gap and extending to a substantially fixed support relative to the pole



surfaces, the support arm comprising a pair of plastically deformable struts that extend along a substantial portion of the support arm and that are mutually spaced in a direction generally perpendicular to the pole surfaces, the spacing being less at one end of the pair of struts than at the other end.

4,518,832

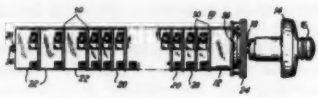
ROTARY AND/OR PUSH-PULL WIPING SWITCH

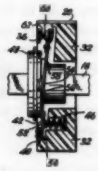
Leo F. Geremia, Wallingford, Conn., assignor to Haydon Switch & Instrument, Inc., Waterbury, Conn.

Filed Aug. 24, 1983, Ser. No. 526,032

Int. Cl.³ H01H *1/18, 9/00, 13/00, 21/80*

U.S. Cl. 200—4 **15 Claims**





13. In a switch assembly of the combined rotary and push-pull type in which there are a plurality of stacked switch sections, including at least one rotary switch section and at least

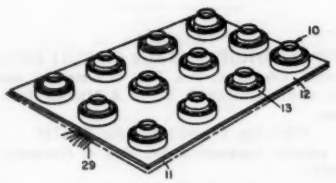
one push-pull switch section, and which are actuated by a common central shaft passing through said sections and being rotatable and displaceable axially, at least to a limited extent, to change the state of said rotary and push-pull switching sections, respectively; in which said at least one rotary section includes at least one pair of terminals, a rotary cam rotatable with said shaft, a substantially rigid cam follower contact arm biassed against said rotary cam and movable, with rotation of said cam between open and closed positions, said contact arm having one end electrically connected with one of said pair of terminals and another end, said other end having a movable contact member disposed thereon to contact a fixed contact member electrically connected to the other of said pair of terminals when said contact arm is in its closed position; and in which said at least one push-pull switch section includes at least one pair of terminals and an insulating carrier member disposed to move axially with said shaft between open and closed positions, and a pair of movable contact members mounted on said carrier to contact corresponding fixed contact members electrically coupled to said terminals when said carrier member is in its closed position; the improvement wherein said other end of said cam follower contact arm includes a flexible resilient conductive leaf, with the contact member of said contact arm being mounted on said leaf; and wherein said carrier member of said push-pull switch section includes a flexible resilient conductive leaf mounting each of the movable contacts associate said carrier member that whenever said shaft is rotated and/or the respective one of displaced to bring axially said cam follower contact arm and said carrier member to the closed position thereof, bending of the associated leaf member causes the respective movable contact member to close with its mating fixed contact member with a wiping action.

4,518,833

CONDUCTIVE ELASTOMERIC INK COMPOSITION

Richard L. Watkins, Westminster, Colo., assignor to Gates Data Products, Inc., Colorado Springs, Colo.

Filed Jul. 21, 1983, Ser. No. 515,823
Int. Cl.³ H01H *9/26*
U.S. Cl. 200—5 A **17 Claims**



1. A switch device comprising at least one contact and movable contactor for engagement therewith, at least the contact or contactor comprising a dry electrically conductive elastomeric ink composition which comprises an elastomeric cured silicone binder and finely divided nickel particles interspersed therein in an amount from about 25 to about 90 percent by weight based on the weight of the composition, the nickel particles having a size in the range from about 0.05 to about 32 microns.

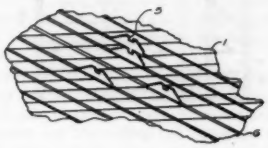
16. A switch device comprising a contact member and an elastomeric switch control device having a movable contactor thereon for engagement with the contact member, at least the contactor comprising a dry electrically conductive elastomeric ink composition which comprises an elastomeric cured silicone binder and conductive particles interspersed therein comprising particulate graphite on which is coated on the surface thereof finely divided nickel particles having a size in the range from about 0.05 to about 5 microns, the nickel coated graphite particles being interspersed in the silicone binder in an amount from about 25 to about 90 percent by weight based on the weight of the ink composition.

4,518,834

MATRIX SLIDE SWITCH

Peter C. Paranicas, Westbury, N.Y., assignor to LVC Industries, Inc., Freeport, N.Y.

Filed Sep. 7, 1983, Ser. No. 529,949
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 D **7 Claims**



1. A matrix switch assembly comprising:

(a) a first insulating board having a plurality of parallel longitudinal slots extending in a first direction and a first surface with a first plurality of conductive strips disposed along and partially split by said slots:

(b) a second insulating board secured to said first board and having a second surface facing said first surface with a second plurality of conductive strips extending in a second direction, each said second conductive strip having a plurality of rectangular indexing holes, each hole being defined by at least two conductive edges spaced at a predetermined distance and oriented in said first direction; and

(c) a plurality of switching means slidably disposed in said longitudinal slots, each switching means having a curved portion disposed between said first board and second board, said curved portion being larger than the distance between said edges so that when one of said switching means is positioned for contacting one of said second strips, electric contact is made between two points of said portion and the respective edges of the corresponding rectangular hole, at least one part of said portion being disposed below said edges, each switching means further having a conductive element in contact with said portion for contacting the corresponding first conductive strip.

4,518,835

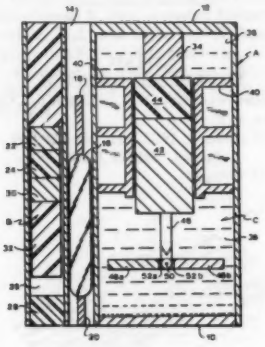
FORCE RESPONSIVE SWITCH

Francis Grossar, Heers, Belgium, assignor to General Instrument Corp., Clifton, N.J.

Filed Aug. 23, 1983, Ser. No. 525,172
Claims priority, application Belgium, Sep. 1, 1982, 0/208929
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 M **22 Claims**

1. A force responsive switch comprising magnetically operated means switchable between first and second states and first and second magnetic means for controlling the state of said switchable means, said first magnetic control means reacting relatively rapidly to the application of a force above a given magnitude and being adapted to change the state of said switchable means from a first state to a second state, said second magnetic control means reacting relatively slowly to the application of force above said given magnitude and being

adapted to change the state of said switchable means from said second state to said first stage a predetermined time interval



after the application of the force above said given magnitude has terminated.

4,518,836

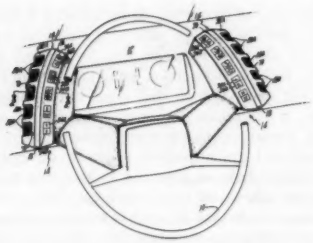
CONTROL POD AND SWITCH ASSEMBLY

George A. Wooldridge, Warren, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Apr. 14, 1984, Ser. No. 601,190

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—61.54 **17 Claims**



1. A control pod for use in vehicles comprising, in combination:

a hollow pod housing including a control-input portion, said housing being adapted for cantilevered mounting in the vehicle such that said control-input portion thereof is positioned for easy access by one hand of an operator;

at least one pair of functionally-related switches mounted interiorly of said housing, each said switch being responsive to a respective mechanical input stimulus to effect switch actuation;

at least one pair of manually-operated switch actuators, said pair of actuators being mounted in said housing and being configured and positioned such that a respective said actuator is associated with a respective said switch and includes a respective tactile region and a switch-contacting portion; and

each said pair of actuator tactile input regions being located at the control-input portion of said housing and positioned for readily accessible, manually-complemental operation by one hand of an operator.

4,518,837

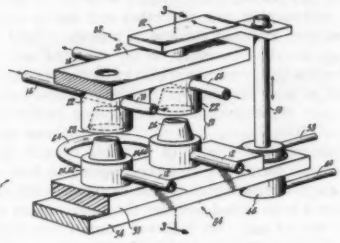
ELECTRICAL SWITCH FOR INDUCTION HEATING SYSTEM

Thomas R. Wagner, New Hartford, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 12, 1983, Ser. No. 512,933

Int. Cl.³ H01H *35/24, 9/52*

U.S. Cl. 200—81 R **11 Claims**



1. A switch for controlling the flow of electrical current comprised of

a first part having mounted thereon a contact having a conical shaped male section;

a second part movable with respect to the first part, having mounted thereon a contact having a conical shaped female section adapted to intimately receive the male contact section, the parts shaped so that movement of the second part toward the first part enables conical mating of the female contact with the male contact to form a contact set which allows the flow of electrical current therethrough;

both said contacts having channels which provide for coolant flow through the set along a path different from that of the electric current flow, said coolant flow path being maintained during times when said parts of the switch are moved apart; and

means for clamping which when actuated force the first part against the second part and which when released permit separation of the parts and subsequent free relative movement of the parts in any direction.

4,518,838

MULTIPOLE HIGH VOLTAGE CIRCUIT BREAKER

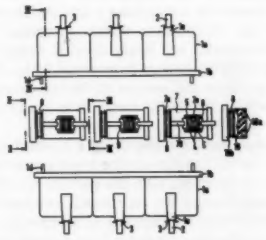
Peter Werner, Oberursel, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,734

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304272

Int. Cl.³ H01H *19/04*

U.S. Cl. 200—303 **13 Claims**



1. A multipole high voltage circuit breaker comprising:

at least two flanged housing shells for joining together along respective peripheral flanges for forming a housing and

defining a plurality of compartments corresponding to respective poles of the circuit breaker;

a plurality of tubular bodies housed in respective ones of said compartments and joined to one another for joint rotation as a switch actuator shaft;

an external drive element on each of said tubular bodies, each tubular body further having a circular bearing groove in the vicinity of said external drive element;

an internal drive element arranged at an end of each of said tubular bodies which is distal from said external drive element, said internal drive element being engageable with an external drive element of an adjacent tubular body for transmitting drive therebetween;

a plurality of end walls and intermediate walls formed of semiannular discs for cooperating with said flanged housing shells to form boundary walls for each pole of the circuit breaker, said end walls and intermediate walls being engaged by said bearing grooves of said tubular bodies for mounting said switch actuator shaft in said housing;

a plurality of internal contacts fixedly mounted in said housing; and

a plurality of switch elements arranged on said switch actuator shaft, said switch elements being movable between engaged and disengaged positions with respect to said fixed internal contacts upon rotation of said switch actuator shaft, each switch element having a pair of jaws which are spaced apart to receive a respective internal contact therebetween.

4,518,839

HIGH FREQUENCY HEATING APPARATUS WITH WIRELESS TEMPERATURE PROBE

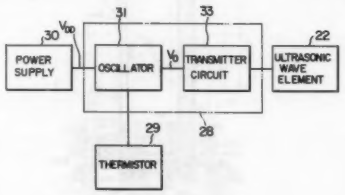
Shunichi Taguchi; Shuji Ohkawa; Mitsuru Watanabe, all of Yokohama, and Itsuo Kikuchi, Ibaraki, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed Mar. 2, 1983, Ser. No. 471,433

Claims priority, application Japan, Mar. 3, 1982, 57-33242; Jul. 7, 1982, 57-118003; Sep. 7, 1982, 57-155704; Sep. 7, 1982, 57-155705

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **22 Claims**



1. A high frequency heating apparatus with a wireless temperature probe, comprising:

a. a heating chamber for containing an object to be heated;

b. high frequency power supply means for supplying high frequency power into said heating chamber thereby to heat said object housed in said heating chamber;

c. a power supply circuit section for receiving the high frequency power supplied into said heating chamber from said high frequency power supply means at an appropriate position in said heating chamber and rectifying said high frequency power thereby to provide a DC power supply, a temperature-measuring section including a thermistor for sensing the temperature of the inside of said object to be heated, an oscillator circuit section for oscillating at a frequency determined by a time-constant capacitor and the resistance value of said thermistor of said temperature-measuring section, an ultrasonic wave transmitter section driven by said oscillator circuit section for transmitting an ultrasonic wave, and casing means for protecting said power supply circuit section, said temperature measuring section, said oscillator circuit section and said ultrasonic wave transmitter section from the strong electric field of high frequency in said heating chamber, said power supply circuit including a rectifying diode and strip lines, said strip lines including a main line for conducting the high frequency in said high frequency heating chamber, shorting lines for forming an electric wave shorting plane at the position of said rectifying diode, and a DC feedback line for passing the rectified DC power, the main line being about $\lambda g/2$ long, the shorting lines and the DC feedback line being $\lambda g/4$ long where λg is the wavelength of the high frequency on the strip lines;

d. an ultrasonic wave receiving section mounted on the wall of said heating chamber and protected from the strong electric field of high frequency in said heating chamber for receiving the ultrasonic wave transmitted from said ultrasonic wave transmitter section contained in said casing means;

e. signal processing means for deciding the temperature of said object on the basis of the ultrasonic wave signal received at said ultrasonic wave receiving section; and

f. control means for controlling the operation of said high frequency power supply means on the basis of the signal from said signal processing means.

4,518,840

METHOD AND APPARATUS FOR MINIMIZING THE POWER INDUCED IN A FLAT CONDUCTING PRODUCT MAINTAINED IN POSITION ELECTROMAGNETICALLY WITHOUT CONTACT

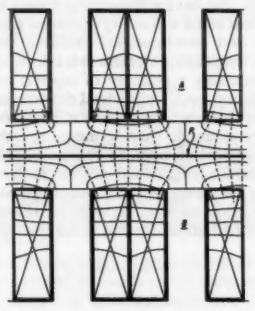
Jean-Claude Bronner, Rueil-Malmaison, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Filed Feb. 8, 1983, Ser. No. 464,952

Claims priority, application France, Feb. 18, 1982, 80 02679

Int. Cl.³ H05B *5/00, 6/64*

U.S. Cl. 219—10.67 **12 Claims**



1. A method for minimizing the power induced in a flat, conducting product exposed to electromagnetic forces to maintain the product in position without contact comprising subjecting certain zones of the product to two alternating, essentially equivalent, opposing magnetic fluxes acting perpendicularly to surfaces of the product on opposite sides thereof so that, in each of said zones, with the product in a position of equilibrium, the component of magnetic flux of the resultant field perpendicular to each zone is minimal and the component parallel to each zone is at a maximum, due to the mutual deflection of the two fluxes.

2. Apparatus for minimizing the power induced in a thin conducting product, exposed to electromagnetic forces to maintain it in position without contact comprising, for each zone in which electromagnetic forces are induced, at least one pair of inductors, each with several poles, the polar surfaces of

which are essentially parallel to a surface of the product in each zone, the two inductors of the pair being placed in an essentially symmetrical manner with respect to a location in the zone corresponding to the desired equilibrium position of the product, with the poles facing each other in pairs on either side of the product being maintained at any instant at the same polarity and with the magnetic fluxes passing through them of essentially the same magnitude so that, with said thin product being located in said zone corresponding to said equilibrium position, said magnetic fluxes mutually deflect in said zone to minimize the power induced in said thin product.

4,518,841

DEVICE FOR PRODUCING REINFORCEMENTS FOR USE IN REINFORCED CONCRETE

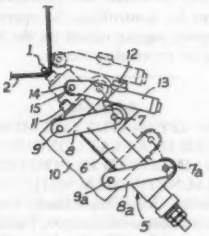
Bertrand L. de Bentzmann, Bragueze, Roumagne, France

Filed Jun. 14, 1983, Ser. No. 504,145

Claims priority, application France, Jun. 23, 1982, 82 11001

Int. Cl.³ B23K *11/32*

U.S. Cl. 219—56 **6 Claims**



1. A device for producing reinforcements for use in reinforced concrete wherein the reinforcement is defined by laterally spaced parallel longitudinal elements joined by transverse wire elements formed about and welded to each of said longitudinal elements; said device comprising means for forming a transverse element about a plurality of spaced parallel longitudinal elements and simultaneously welding the transverse element to each longitudinal element as it is formed thereabout, said means comprising a plurality of support members, one positionable adjacent each longitudinal element, means mounting each support member for extension and retraction, each support member mounting shaping means operable, upon extension of the support member, to engage and shape a transverse element about a longitudinal element, each support member additionally mounting welding means operable, upon extension of the support member, to weld the shaped transverse element to the longitudinal element at the time of the shaping thereof.

4,518,842

METHOD OF CONTROLLING WIRE-CUT ELECTRIC DISCHARGE CONTOUR MACHINES ERRORS

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

Filed Dec. 22, 1982, Ser. No. 452,141

Claims priority, application Japan, Dec. 30, 1981, 56-210769

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **4 Claims**

2. A method of controlling a wire-cut electric discharge machine for applying a voltage between a wire electrode and a workpiece to generate electric discharge therebetween to cut the workpiece to a desired slot contour such as an arc or a corner while the workpiece is moved with respect to the wire electrode, said method comprising the steps of:

measuring an amount of flexing of the wire electrode which is caused during rectilinear cutting of the workpiece using a discharge power;

determining an allowable amount of flexing of the wire electrode based upon a tolerable value for the amount of bluntness of the contour of the workpiece;

correcting the discharge power based on the measured amount of flexing and the allowable amount of flexing of the wire electrode;

increasing a tension to which the wire electrode is subjected; and

lowering a speed of relative movement between the workpiece and the wire electrode in accordance with the increased tension to compensate for a change in the width of the slot which is caused by the increased tension.

4,518,843

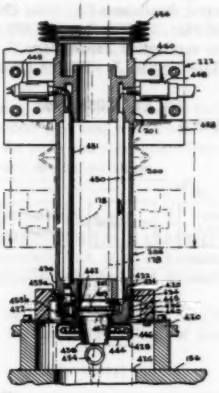
LASER LENS AND LIGHT ASSEMBLY

Ronald F. Antol, North Huntingdon Township, Westmoreland County; Ralph W. Kalkbrenner, Irwin, and Richard M. Kobuck, Delmont, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,205

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LC **17 Claims**



1. Apparatus for laser machining a work piece by precisely directing and focusing a laser beam onto the work piece, said laser machining apparatus comprising:

(a) a laser lens for focusing the laser beam onto the work piece;

(b) a cylindrical base for defining a path along which the laser beam passes to the work piece;

(c) a mounting member for receiving said laser lens adapted to be removably attached to said cylindrical base to permit cleaning of debris thrown off from the work piece during machining;

(d) means for securing said laser lens to said mounting member; and

(e) locking means for releasably attaching said mounting member to said cylindrical base and for resiliently biasing said mounting member and therefor also its secured said

laser lens so that said laser lens is precisely positioned at a certain position with respect to said cylindrical base.

4,518,844

SHORT-CIRCUIT MIG WELDING

James C. Needham, Saffron Walden, England, assignor to The Welding Institute, Cambridge, England

Filed Mar. 7, 1984, Ser. No. 587,310

Claims priority, application United Kingdom, Mar. 10, 1983, 8306578

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—137 PS **22 Claims**

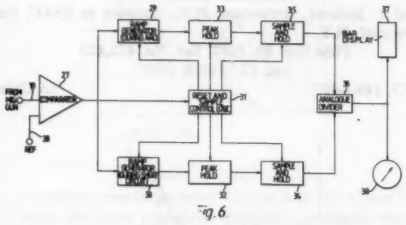


Fig. 6.

1. In a method of short-circuit MIG welding in which electrode wire and a workpiece in a welding circuit are moved relatively to one another and in which periods of arcing and short-circuiting successively occur between the electrode wire and the workpiece the improvement comprising monitoring the ratio of the mean of the arc duration to the mean of the short-circuit duration.

4,518,845

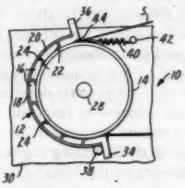
DEVICE FOR PROCESSING THERMALLY DEVELOPABLE FILMS AND PAPERS

John A. Svendsen, May Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 3, 1982, Ser. No. 438,752

Int. Cl.³ H05B *1/00;* **G03D** *15/02*

U.S. Cl. 219—216 **8 Claims**



1. Device for thermally developing papers and films which are developable by heat comprising:

(a) a heat conductive member defining a partially-cylindrical heating zone through which said papers and films may be moved to effect development, said heat conductive member comprising a plurality of independently moveable, elongated, bar-shaped heat conductive elements arranged in an arcuate array about said zone so that spaces exist between said elements,

(b) pressure applying means for pressing said papers and films against said heat conductive member,

(c) means for preventing rotational movement of said heat conductive member,

(d) means for heating said heat conductive elements, and

(e) means for resiliantly biasing said heating means and said elements toward and into contact with said papers and films which are moved through said zone,

whereby said papers and films are heated for development, and moisture vapor released from said papers and films may pass through said spaces to restrict uneven development within said zone.

4,518,846

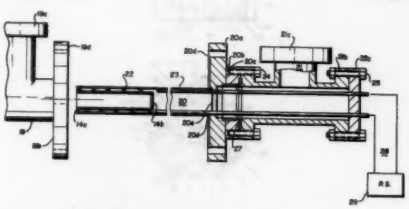
HEATER ASSEMBLY FOR MOLECULAR BEAM EPITAXY FURNACE

John L. Freeouf, and Thomas N. Jackson, both of Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,106

Int. Cl.³ C23C *13/12*

U.S. Cl. 219—271 **4 Claims**



1. In a molecular beam epitaxy furnace, a heater for heating the interior of an effusion cell comprising:

an outer cylindrical sleeve having one end connected to receive a vacuum and an opposite end;

an inner sleeve coaxial with said outer cylindrical sleeve, having one end sealed with said outer cylindrical sleeve opposite end, and extending along a portion of said cylindrical sleeve to a closed opposite end, said inner sleeve, and outer cylindrical sleeve providing an interior vacuum chamber; and,

a heating element disposed between said cylindrical sleeve and inner sleeve for heating said interior vacuum chamber and a crucible located in said inner sleeve, whereby semiconductor constituent materials in said crucible are evaporated in an environment free from contaminants produced by said heating element.

4,518,847

ELECTRICALLY-POWERED PORTABLE SPACE HEATER

Paul V. Horst, Sr., Boulder, and Charles D. Hoyt, Northglenn, both of Colo., assignors to Crockett & Kelly, Inc., Broomfield, Colo.

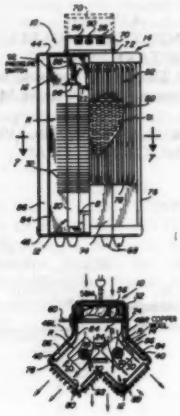
Filed Nov. 2, 1982, Ser. No. 438,593

Int. Cl.³ H05B *1/02;* **F24H** *3/08;* **F24D** *13/04*

U.S. Cl. 219—365 **6 Claims**

1. A space heater which comprises: top and bottom walls, a rear wall and angled sidewalls cooperating with one another in assembled relation to define an open front housing having a generally Y-shaped transverse section with a stem-forming portion at the rear and a pair of divergent branch portions opening toward the front thereof; a horizontally-disposed boiler extending transversely of the housing in the bottom thereof at the juncture between the stem and branched portions; a heat transfer fluid in said boiler containing a vaporizable component ; heating means for heating the heat transfer fluid and boiling the vaporizable component thereof; a pair of vertically-disposed spaced heat exchangers mounted, respectively, in the branch portions of the housing and connected to receive hot vapor from the boiler; and a blower located in the stem-forming portion of the housing positioned and adapted to receive ambient air from the environment through an air inlet in said stem portion and direct the same forwardly between the heat exchangers in heat exchange relation thereto, said heat exchangers cooperating with one another and the angled sidewalls of the housing to split off parts of the forwardly-directed

airstream and direct the same out sideways through the branch portions, and said diverted parts of the airstream combining



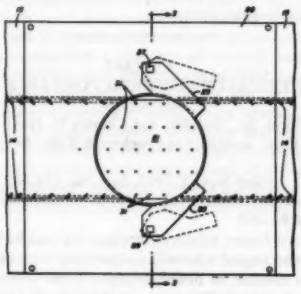
with the forwardly-directed part passing between the heat exchangers to produce a spread of heated air at least approximately 90° in angular extent.

4,518,848

APPARATUS FOR BAKING RESIST ON SEMICONDUCTOR WAFERS

T. Jerome Weber, Mt. View, Calif., assignor to GCA Corporation, Bedford, Mass.

Filed May 15, 1981, Ser. No. 263,928
Int. Cl.³ F27B *9/06*; F27D *11/02*
U.S. Cl. 219—388 **10 Claims**



1. Apparatus for baking resist on the upper surface of a semiconductor wafer, said apparatus comprising:

a heating station;

means for transporting wafers sequentially to said heating station;

at said heating station, a thin disc-like heater plate having a diameter essentially not smaller than that of a wafer to be baked, the heat capacity of said heater plate being essentially uniform over its surface and not greatly disparate from that of the wafers to be baked, said heater plate including a heating means which effects essentially uniform heating thereof,

means for energizing said heater plate, prior to a bake cycle, to raise said plate to a temperature substantially above the temperature desired at which the resist is to be baked;

selective actuable stop means in line with said transporting means for stopping a wafer in line with said plate; and

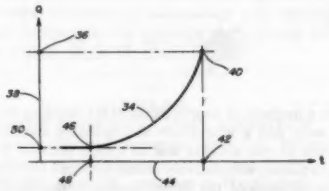
bringing the wafers into alignment and contact with said plate for a preselectable time during which a predetermining heating impulse is provided through the wafer to resist on its upper surface, the plate being cooled as the wafer is heated, the wafer being then removed from the plate to effectively terminate the baking.

4,518,849

ELECTRONIC TOASTER TIMER WITH PRECEDING OFF-TIME TEMPERATURE CONTROL COMPENSATION

Gerard T. Rolland, Brewerton, N.Y., assignor to SSAC, Inc., Liverpool, N.Y.

Filed Sep. 30, 1982, Ser. No. 432,123
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—492 **13 Claims**



5. In combination with an electrical toaster having a heater element, a source of voltage, a manually operable power switch connected to the source, timer means connected to the power switch for intermittently energizing the heater element during timing cycles of limited duration in response to actuation of the power switch, said timing cycles being spaced by off-time intervals during which the heater element is deenergized, and a toast darkness selector connected to the timer means for selecting the duration of said timing cycles, the improvement comprising capacitor means discharged during said off-time intervals between the timing cycles for establishing a voltage discharge level in the timer means, and means responsive to variations in the discharge level of the capacitor means for reducing the selected duration of each of the timing cycles as an inverse function of the off-time intervals preceding the timing cycles, said timer means including a timing capacitor charged from said source simultaneously with said energization of the heater element at a rate determined by adjustment of the toast darkness selector in response to actuation of the power switch, and means responsive to establishment of a threshold voltage level of the timing capacitor for discharging said capacitor to deenergize the heater element, said capacitor means including a second storage capacitor connected to the toast darkness selector, means for discharging the second storage capacitor in response to said deenergization of the heater element upon termination of one of the timing cycles, and means for delaying said discharge of the second storage capacitor to shorten the succeeding timing cycles.

4,518,850

ELECTRIC COOKER HAVING TEMPERATURE WARNING MEANS

Alfie L. Grasso, Bewdley, England, assignor to Micropore International Limited, Droitwich, England

Filed Feb. 10, 1982, Ser. No. 347,537
Claims priority, application United Kingdom, Feb. 18, 1981, 8105068; Dec. 17, 1981, 8138031
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—505 **9 Claims**

1. An electric cooker comprising:

a cooking surface;

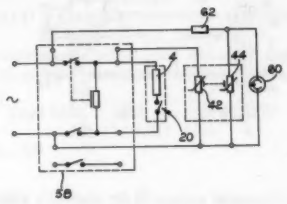
one or more electrical heaters arranged on the underside of the cooking surface;

a temperature monitoring device in the form of a hollow cylindrical housing which is closed at one end and having mounted therein;

a thermally responsive device in the form of a thermistor;

an auxiliary electrical heater for supplying heat to the thermistor when at least one of said one or more electrical heaters is energized; and

a thermal buffer located between the auxiliary heater and the thermistor such that the thermistor is heated to at least a



predetermined temperature after at least one of said one or more electrical heaters is energized consistent with said cooking surface rising above a safe touching temperature;

means for thermally coupling said temperature monitoring device with at least one of said one or more electrical heaters such that when said one or more electrical heaters are subsequently de-energized said thermistor cools below said predetermined temperature consistent with said cooking surface falling to said safe touching temperature; and

means for indicating when said thermistor is at or above said predetermined temperature.

4,518,851

PLANAR HEATING ELEMENT

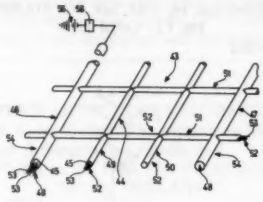
Hans Oppitz, Mils, Austria, assignor to Eltac Nogler & Daum KG, Innsbruck, Austria

Filed Nov. 7, 1983, Ser. No. 549,613

Claims priority, application Austria, Nov. 11, 1982, 4094/82

Int. Cl.³ H05B *3/38*

U.S. Cl. 219—549 **7 Claims**



1. A planar heating element having a positive temperature coefficient, which comprises a plurality of spaced electric current supply lines and a planar support equally flexible in all direction and constituted by a net, the electric current supply lines forming strands of the planar net support, and all the net strands including an electrically conductive synthetic resin whose electrical resistance has a positive temperature coefficient.

4,518,852

METHOD FOR OPERATING AUTOMATIC DEVICES SUCH AS CASH REGISTERS OR THE LIKE AND A DEVICE FOR CARRYING OUT THE METHOD

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Strasse 36, D-7730 VS-Villingen, both of Fed. Rep. of Germany

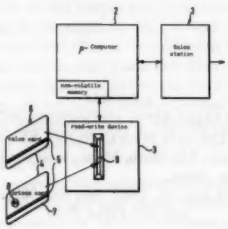
PCT No. PCT/EP82/00059, § 371 Date Nov. 8, 1982, § 102(e) Date Nov. 8, 1982, PCT Pub. No. WO82/03289, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 23, 1982, Ser. No. 442,225

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111355

Int. Cl.³ G06F *7/08*

U.S. Cl. 235—381 **6 Claims**



1. A cash register apparatus comprising:

a computer having a memory for storing price parameters for goods and/or services; and

a read-write device connected with said computer, said read-write device including means for reading a card-like data carrier, means for checking said data carrier for authenticity, and means for reading a value card presented for a purchase operation and for reading a prices card comprising information for determining said price parameters in said memory, whereby said single read-write device can handle said value card and said prices card to perform a purchase operation and a price determining operation.

4,518,853

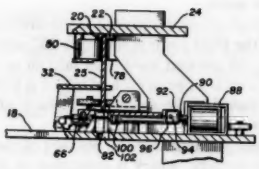
MAGNETIC STRIPE CHARACTER APPLYING MODULE

Edward R. Gabel, Minnetonka; Edward J. Puumala, Minneapolis, and Rodney J. LeVasseur, Farmington, all of Minn., assignors to Data Card Corporation, Minnetonka, Minn.

Filed May 12, 1983, Ser. No. 493,771

Int. Cl.³ G06K *7/08*

U.S. Cl. 235—449 **15 Claims**



1. A card transport module for receiving cards inserted at an input end of a card transfer path and delivering cards at an output end of the transfer path comprising, in combination:

(a) a frame having a card transfer path thereupon;

(b) carriage means mounted on said frame for moving the card along said transfer path, said carriage means including card engaging means for engaging an edge of the card when in a first operating condition and for releasing the card when in a second operating condition, said transport means being movable along an axis parallel to the card

transfer path for moving the card along the path when in the first operating condition and for moving independently of the card when in the second operating condition;

(c) control means for switching said card engaging means between said first and said second operating conditions at the ends of the card transfer path; and

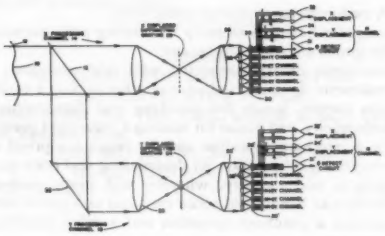
(d) drive means for moving said carriage means to transport a card from the input end of the card transfer path to the output end and for returning said carriage means to the input end of said card transfer path.

4,518,854

COMBINED SHEARING INTERFEROMETER AND HARTMANN WAVEFRONT SENSOR

Richard A. Hutchin, Marlboro, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jun. 17, 1982, Ser. No. 389,330
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **4 Claims**



1. A wavefront sensor for generating two substantially independent indications of the slope of an incident wavefront, thereby providing a comparatively sensitive wavefront sensor, comprising:

a. focusing means for focusing an incident wavefront, the slope of which is to be detected, to a focal point;

b. a first diffraction grating, positioned substantially at the focal point of said focusing means, for shearing and modulating the focused wavefront, which then diverges beyond the focal point;

c. first optical means, positioned in the diverging wavefront beyond the focal point at said first diffraction grating, for dividing the sheared wavefront into an array of subapertures, the local slope of each of which is to be determined, and for focusing the wavefront in each subaperture to a focal point;

d. first means for detecting the position of the focal point in each subaperture, which is indicative of the local wavefront slope in that subaperture, and for producing a positional output signal representative thereof; and

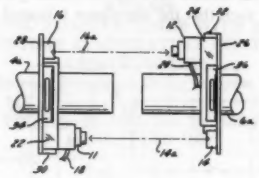
e. first means for detecting the radiation in each subaperture as modulated by said first diffraction grating and for producing a modulated output signal representative thereof, the phase of which relative to modulation by the first diffraction grating is also indicative of the local slope in that subaperture, whereby two substantially independent indications of the local slope of the wavefront in each subaperture are obtained to provide a comparatively sensitive wavefront sensor.

4,518,855

METHOD AND APPARATUS FOR STATICALLY ALIGNING SHAFTS AND MONITORING SHAFT ALIGNMENT

Stephen P. Malak, Milwaukee, Wis., assignor to Spring-Mornne, Inc., Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 430,333
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **45 Claims**



1. A shaft alignment apparatus for statically aligning a first shaft with a second shaft, comprising:

a first dual-axis position sensing detector providing a first signal;

a second dual-axis position sensing detector providing a second signal;

first mount means for mounting the first dual-axis position sensing detector to the first shaft;

second mount means for mounting the second dual-axis position sensing detector to the second shaft;

a first alignment radiation source mounted on the first mount means and oriented to provide a first alignment radiation beam to the second dual-axis position sensing detector to generate the second signal;

a second alignment radiation source mounted on the second mount means and oriented to provide a second alignment radiation beam to the first dual-axis position sensing detector to generate the first signal; and

a readout means having defined alignment conditions and being responsive to the first signal and the second signal for visually displaying shaft alignment, whereby with adjustment of the first shaft with respect to the second shaft, alignment of the first shaft with the second shaft will be indicated on the readout means according to the defined alignment conditions.

4,518,856

LINE SENSING METHOD AND APPARATUS

Paul A. Blackington, Vandling, Pa., assignor to Sheltered Workshop for the Disabled, Inc., Binghamton, N.Y.

Filed Sep. 14, 1982, Ser. No. 418,006
Int. Cl.³ G05B *1/00*
U.S. Cl. 250—202 **8 Claims**

1. Optical sensing apparatus for sensing a line carried on a surface having a contrasting energy-reflective property, comprising in combination: first and second optic fibers each having a first end affixed to a sensing head member with the first ends of said fibers pointing in the same direction, and each having a second end, the first ends of said fibers being spaced

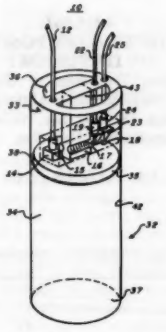
apart at a distance such that said line affects direct reception of reflected light by each of said fibers when a midpoint between said fibers is centered over said line; first and second photosensors, each of said photosensors being connected to receive light from the second end of a respective one of said optic fibers and to provide a respective electrical signal commensurate with the amount of light directly reflected into said respective one of said optic fibers; and a differential amplifier connected to provide an output signal commensurate with the difference between said photosensor electrical signals.

4,518,857

TEMPERATURE AND PRESSURE COMPENSATED ELASTO-OPTIC SENSOR

Donald H. McMahon, Carlisle, and William B. Spillman, Jr., Acton, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 473,170
Int. Cl.³ G02F *1/01*
U.S. Cl. 250—225 **10 Claims**



1. An apparatus for sensing acoustic signals of the type having a transducer which includes input and output optical fibers, light polarizers, and components in cooperation with a birefringent element having pressure sensitive birefringent properties for measuring differential phase of optical signals, further comprising:

a housing having closed and open ends;

means for sealing said housing and for transferring pressure variations caused by incident acoustic signals to said birefringent element; and

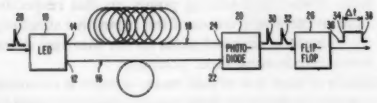
rigid diaphragm means coupled to said birefringent element and located in said housing to form a first chamber wherein said transducer is positioned, and a second chamber, said rigid means being movable for neutralizing pressure applied to said diaphragm and birefringent elements.

4,518,858

FIBER OPTIC TIME STANDARD

Gary Southard, Coral Springs, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Dec. 20, 1982, Ser. No. 451,220
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **9 Claims**



1. Apparatus for producing a time standard comprising:

(a) a source of radiation;

(b) first and second fibers capable of transmitting said radiation;

(1) each of said fibers having an input end and an output end, said input end of said first fiber and said input end of said second fiber being arranged to receive said radiation from said source at substantially the same time,

(2) said first fiber having an index of refraction N_1, and length L_1, said second fiber having an index of refraction N_2 and length L_2, said indices of refraction N_1 and N_2 and said lengths L_1 and L_2 being chosen such that said radiation propagates from said input end of said first fiber to said output end of said first fiber faster than said radiation propagates from said input end of said second fiber to said output end of said second fiber, and the change in propagation time of said radiation transmitted by said first fiber from said input end of said first fiber to said output end of said first fiber due to a change in temperature substantially equals the change in propagation time of said radiation transmitted by said second fiber from said input end of said second fiber to said output end of said second fiber due to said change in temperature, and

(c) means for receiving the radiation emitted from said output ends of said first and said second fibers and producing a signal representative of the difference between said propagation time from said input of said first fiber to said output of said first fiber and said propagation time from said input of said second fiber to said output of said second fiber.

4,518,859

ANGLE MEASURING DEVICE WITH LINE SENSOR

Shuji Hoshika, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,345
Claims priority, application Japan, Dec. 20, 1980, 55-181025
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—231 SE **13 Claims**

1. An angle measuring device comprising:

a scale board having a scale which consists of substantially equiangular transparent portions and opaque portions which are alternately arranged at equiangular intervals in the form of a circle;

light source means for illuminating said scale on said scale board;

line sensor means having a plurality of substantially contiguous light receiving sections.

projection lens means for projecting an image of said scale of said scale board in such a manner that the pitch of an image of a combined transparent and opaque portion is greater than twice the pitch of said light receiving sections in said line sensor means;

a processing circuit for detecting an angle of rotation of said scale board from the values of multiple finite outputs of said line sensor with a resolution substantially greater than said equiangular interval; and

a display section for displaying an output of said processing circuit.

4,518,860
COMPACT DETECTOR FOR RADON AND RADON DAUGHTER PRODUCTS

H. Ward Alter, Walnut Creek, and Richard A. Oswald, Benicia, both of Calif., assignors to Terradex Corporation, Walnut Creek, Calif.

Filed Oct. 19, 1982, Ser. No. 435,197
Int. Cl.³ G01V 5/00
U.S. Cl. 250—253 19 Claims

1. An improved compact track registration detector for radon gas, said detector comprising:

a housing having an open mouth, a bottom and side walls defining an interior volume;

means for providing longitudinal and lateral support within said housing adjacent the inner side wall surfaces and said mouth;

track registration means supported in the interior of said housing by said support means, said track registration means having the property of forming damage tracks therein along paths traversed by alpha particles;

microporous filter means positioned across the mouth of said housing for preventing entry of radon daughters and particulate matter into said housing interior so that substantially only gases enter said volume; and

an apertured cap removably received on the mouth end of said housing for retaining said filter means and said track registration means in place adjacent said mouth,

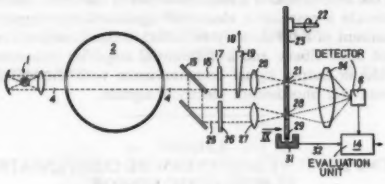
said housing having internal wall surfaces dimensioned to optimize the registration of alpha particles from radon present in said housing interior and from radon daughter products present in said housing interior which are a result of the decay of radon gas admitted through said filter means into said housing interior.

4,518,861
METHOD FOR THE CONTINUOUS MEASUREMENT OF THE MASS OF AEROSOL PARTICLES IN GASEOUS SAMPLES AND A DEVICE FOR THE IMPLEMENTATION OF THE METHOD

Peter W. Krempl; Wolfgang Schindler, both of Graz, and Leopold Faschingleitner, Mank, all of Austria, assignors to Hans List, Graz, Austria

Filed Nov. 5, 1982, Ser. No. 439,596
Claims priority, application Austria, Nov. 9, 1981, 4814/81
Int. Cl.³ G01J 1/00
U.S. Cl. 250—339 16 Claims

1. A method for the continuous measurement of the mass of aerosol particles in gaseous samples, wherein a sample being traversed by electromagnetic radiation of a wavelength greater than the mean radius of said aerosol particles, and the absorption caused being measured for at least two different frequencies, and wherein the difference of the signals which have been received for the different frequencies and which are proportional to the respective absorption is used as a measure-

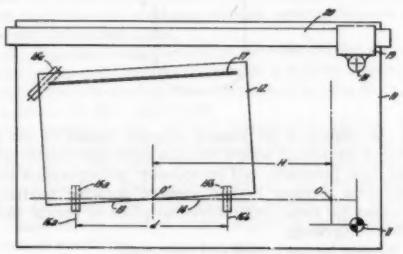


ment value corresponding to the total mass of said aerosol particles.

4,518,862
SYSTEM FOR DETECTING THE POSITION OF A SHEET ON ITS SUPPORT

Alfred Dorn, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Del.X

Filed Sep. 13, 1982, Ser. No. 417,068
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135022
Int. Cl.³ G01B 11/00
U.S. Cl. 250—561 11 Claims



4. An apparatus for determining the position of a sheet when the sheet is placed on a support, comprising, in combination,

at least two spaced-apart image sensors affixed to the support and each having a plurality of light sensing points receiving an image of an edge portion of the sheet when the sheet is placed on the support,

electronic means for scanning the light sensing points of the image sensors along generally linear paths and generating, for each image sensor, a respective electrical signal correlating received light intensity with the position of the scanned light sensing points, and

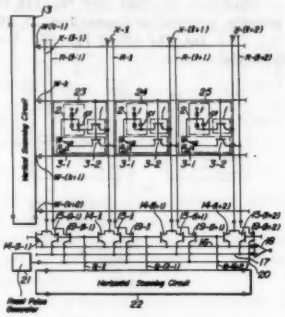
edge detecting means receiving said respective electrical signals for detecting the respective portions of said electrical signals generated by the scanning of the light sensing points receiving the respective images of the edges of the sheet and determining the respective corresponding locations of the light sensing points, so that respective locations of the intersections of the respective sheet edges and the respective scanned paths on the sheet are determined, thereby indicating sheet position,

wherein at least one of said image sensors is oriented on the support to have its light sensing elements partially covered by both a longitudinal and a transverse edge portion of the sheet when the sheet is placed on the support.

4,518,863
STATIC INDUCTION TRANSISTOR IMAGE SENSOR WITH NOISE REDUCTION

Kenji Fukuoka, Fussa; Masatoshi Ida, Hachioji; Atsuo Goto, Hachioji; Toshimasa Akagi, Hachioji; Masaharu Imai, Hino, and Kenji Kimura, Tachikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,915
Claims priority, application Japan, Jul. 16, 1981, 56-111355
Int. Cl.³ H01L 27/14, 31/00
U.S. Cl. 250—578 8 Claims



8. An image sensor comprising:

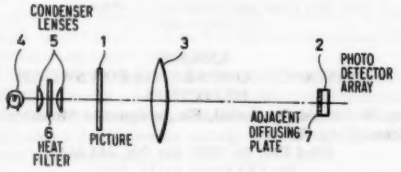
a semiconductor image cell array having a plurality of semiconductor image cells arranged in a matrix, each semiconductor image cell of said matrix including a photoelectric transducer which transforms incident light into an electric charge and integrates that electric charge, a read switching means coupled to said transducer for reading said transducer to provide an output signal representing said integrated electric charge, and a reset switching means coupled to said transducer for resetting said photoelectric transducer; and

means for sequentially scanning each of said semiconductor image cells in such a manner that while one cell is being read the next preceding cell is being reset to cause resetting of each preceding cell simultaneous with the reading of a scanned cell so that the integration time between reset and reading of each cell is substantially the same for all cells.

4,518,864
IMAGE READER WITH A LIGHT DIFFUSER

Masafumi Inuiya, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 293,061, Aug. 17, 1981,. This application Sep. 12, 1984, Ser. No. 649,579
Claims priority, application Japan, Aug. 19, 1980, 55-113593
Int. Cl.³ H04N 5/30
U.S. Cl. 250—578 1 Claim

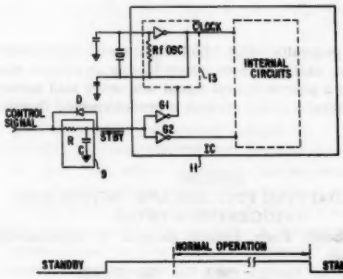


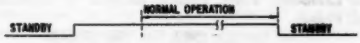
1. An image reader having a solid-state image pickup device consisting of a plurality of photosensitive elements having a surface layer which interferes with light in a photosensitive wavelength range of said solid-state image pickup device, the improvement comprising a diffusing plate disposed adjacent said surface layer for overcoming the interference of said surface layer, said diffusing plate applying light bearing data of a picture to be read to said solid-state image pickup device in a manner that the diffused light to one photosensitive element does not substantially overflow to neighboring photosensitive elements in said pickup device.

4,518,865
MISOPERATION PREVENTION CIRCUIT

Tomonobu Iwasaki, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 11, 1982, Ser. No. 387,559
Claims priority, application Japan, Jun. 18, 1981, 56-94282
Int. Cl.³ H03K 17/06; G06F 1/00, 11/00
U.S. Cl. 307—200 A 4 Claims





1. A misoperation prevention circuit for preventing misoperation of an integrated circuit comprising a logic circuit and an oscillator for providing clock signals to said logic circuit after the release of a standby mode, the misoperation prevention circuit comprising:

an integrator for receiving a control signal, the control signal being supplied for releasing the standby mode;

a control terminal for receiving an output of the integrator;

a first gate circuit having a first threshold voltage connected to the control terminal for triggering the oscillator at said first threshold voltage of said integrated output;

a second gate circuit having a second threshold voltage connected to the control terminal for triggering said logic circuit at said second threshold voltage of said integrated ouptput;

the second threshold voltage being larger than the first threshold voltage so that said second gate circuit is triggered after said first gate circuit and a period of the time elapses during which said oscillator is stabilized.

4,518,866
METHOD OF AND CIRCUIT FOR SIMULATING NEURONS

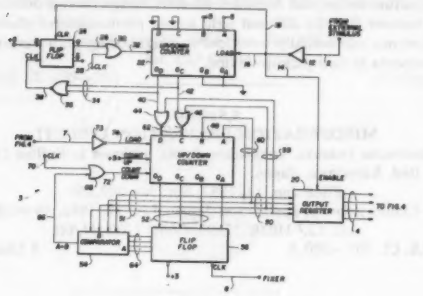
Roy E. Clymer, Columbia, Md., assignor to Psychologics, Inc., Columbia, Md.

Filed Sep. 28, 1982, Ser. No. 425,765
Int. Cl.³ G06F 15/42
U.S. Cl. 307—201 12 Claims

5. A neuron simulator, comprising:

at least one synapse simulator means having an input for receiving a stimulus which then generates as an output, a synaptic value. each said synapse simulator means including means for storing said synaptic value and means for varying said synaptic value depending upon the temporal relationship between said input and the output of said neuron simulator; and

generator means having an input connected to the output of each said synapse simulator means, said generator means including means responsive to successive inputs from said at least one synapse simulator means to produce an accu-



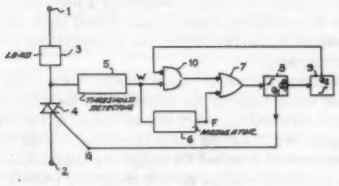
mulated generator value which decays with time toward a rest value, said generator means having an output which produces a neuron output signal whenever said accumulated generator value exceeds a predetermined threshold value.

4,518,867

SELF-ADAPTING PROCESS AND DEVICE FOR TRIGGERING A TRIAC

Jean J. Lamboley, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 23, 1982, Ser. No. 371,420
Claims priority, application France, Apr. 27, 1981, 81 08336
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 B **3 Claims**



1. A triac triggering circuit for use with a triac having two terminals and a gate, and an electric load such that the current in the electric load will progressively decrease when the triac is turned off, said triggering circuit being used for controlling the triac and comprising:

a threshold circuit for outputting a threshold signal indicating that the voltage across the terminals of the triac exceeds a predetermined threshold level;

an adjustable modulating circuit for receiving the threshold signal from said threshold circuit and for supplying to the gate of the triac a first gate pulse of short duration at the end of an adjustable time after issuance of said threshold signal, said first gate pulse being issued only if said threshold signal has not been interrupted during said adjustable time;

means for supplying successive gate pulses of short duration to the gate of the triac; and

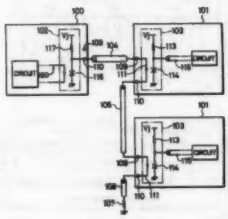
a monostable flip-flop actuated by said first and successive gate pulses for outputting an output signal after each gate pulse, wherein said means for supplying successive gate pulses has inputs connected to the output of said monostable flip-flop, to the output of said threshold circuit, and to said modulating circuit, and having an output supplying a successive gate pulse whenever said threshold signal is issued outside said adjustable time during said output signal, and said output signal having a short duration such that the current in the load will not decrease in a significant way during this duration in case of triggering failure of the triac.

4,518,868

SUPERCONDUCTIVE LARGE-SCALE INTEGRATED CIRCUIT CHIP

Yutaka Harada, Kodaira; Kunio Yamashita, Hachioji; Nobuo Kotera, Kokubunji, and Hirotoshi Tanaka, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,730
Claims priority, application Japan, Jun. 27, 1980, 55-86622
Int. Cl.³ H03K *19/195*
U.S. Cl. 307—306 **2 Claims**



1. A combination of a plurality of superconductive large-scale integrated circuit chips, each comprising:

a plurality of conductive pads which are disposed along at least one of peripheral edges of said chip;

an input superconductive line which short-circuits a pair of said plurality of pads;

an input buffer magnetically coupled to said input superconductive line, said input buffer including a Josephson device which operates in a superconductive state when no current flows through said input superconductive line and in a voltage state when current flows through the input superconductive line, wherein said input buffer further comprises means coupled between the Josephson device and a predetermined circuit in the chip for controlling the application of current to said predetermined circuit in accordance with the state of operation of the Josephson device;

an output superconductive line with the chip coupled to receive an output from the predetermined circuit within the chip so that current flows in said output superconductive line when the predetermined circuit produces an output;

an output buffer magnetically coupled to the output superconductive line, wherein the output buffer includes a Josephson device which operates in a superconductive state when no current flows through the output superconductive line and in a voltage state when the current flows through the output superconductive line,

wherein an output buffer at least one of said superconductive chips is coupled in series to input superconductive lines of at least two other superconductive chips.

4,518,869

RESISTANCE COMPARATOR FOR SWITCH DETECTION

Barry W. Herold, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1982, Ser. No. 451,662
Int. Cl.³ H03K *5/153, 5/24*
U.S. Cl. 307—350 **18 Claims**

1. A resistance comparator having an input and output, comprising:

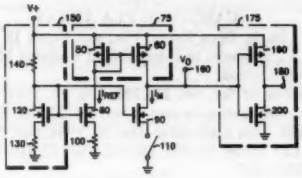
current source means having a reference current output

coupled to a first conduction path and a current limited output coupled to a second conduction path;

first current control means having a first control node for controlling the current flow in said first conduction path;

means for coupling a reference resistance in series with said first conduction path;

second current control means having second control node for controlling the current flow in said second conduction path;



input means for coupling an input resistance in series with said second conduction path; and

means for supplying a bias signal to said first and second control nodes of said first and second current control means respectively,

whereby, the output is in a first logic state when said input resistance is less than a predetermined value and in a second logic state when said input resistance is greater than said predetermined value.

4,518,870

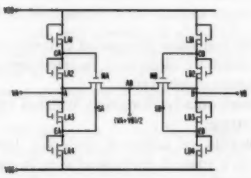
COMMON MODE SIGNAL DETECTOR

Mihai Banu, Woodside, N.Y., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 6, 1983, Ser. No. 539,619

Int. Cl.³ H03F *3/45*

U.S. Cl. 307—356 **10 Claims**



7. A circuit for detecting the common mode signal present on first and second input terminals comprising

(a) a first transistor one of whose high current carrying terminals is connected to the first input terminal;

(b) a second, identical transistor one of whose high current carrying terminals is connected to the second input terminal;

(c) electrically connecting means for connecting another high current terminal of each of the first and second transistors to an output terminal;

(d) first control means, connected to a control terminal of the first transistor, for delivering to the control terminal of the first transistor a first control voltage which is midway between a first reference voltage and the voltage on the first input terminal,

(e) second control means, connected to a control terminal of the second transistor, for delivering to the control terminal of the second transistor a second control voltage which is midway between the first reference voltage and the voltage on the second input terminal.

4,518,871

GA/AS NOR/NAND GATE CIRCUIT USING ENHANCEMENT MODE FET'S

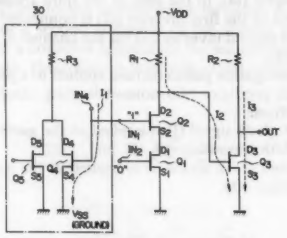
Nobuyuki Toyoda, and Akimichi Hojo, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 15, 1982, Ser. No. 449,997

Claims priority, application Japan, Dec. 26, 1981, 56-214911

Int. Cl.³ H03K *19/003, 19/094, 19/20*

U.S. Cl. 307—443 **12 Claims**



1. A NOR/NAND gate circuit comprising:

a NAND gate comprising at least first and second normally off type field effect transistors having source-to-drain current paths series-connected between a power source (VDD) and a ground potential (VSS) via a load, wherein the source of said first transistor is connected to ground potential and the gate thereof is connected to a first input terminal, and wherein the gate of said second transistor is connected to a second input terminal; and

NOR gate means for bypassing a forward current which would otherwise pass through said NAND gate, comprising third and fourth normally-off field effect transistors having respective source-to-drain current paths connected to ground potential, wherein the gate electrode of one of said third and fourth transistors is connected to said second input terminal and to the gate electrode of said second transistor of said NAND gate.

4,518,872

MOS TRANSITION DETECTOR FOR PLURAL SIGNAL LINES USING NON-OVERLAPPING COMPLEMENTARY INTERROGATION PULSES

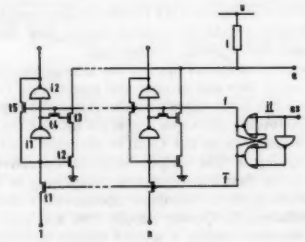
Reiner Backes, Freiburg-Tiengen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,620

Claims priority, application European Pat. Off., Mar. 4, 1982, 82101667.2

Int. Cl.³ H03K *19/096, 17/693*

U.S. Cl. 307—448 **1 Claim**



1. Insulated-gate field-effect transistor integrated circuit for delivering a digital signal (a) at the application of an interrogation pulse (as) if a change of state has occurred in a one-out-of-

n system until the instant of interrogation, characterized by the following features:

each signal (1 . . . n) of the one-out-of-n system is applied via the channel of a first transistor (t1) to the input of a first inverter (i1) and to the gate of a second transistor (t2) whose channel is grounded at one end, while the other end is connected via the channel of a third transistor (t3) to a load device (l) common to all signals (1 . . . n) and connected to a supply-voltage source (u);

the output of the first inverter (i1) is connected to the input of a second inverter (i2) and, via the channel of a fourth transistor (t4), to the gate of the third transistor (t3);

the input of the first inverter (i1) is connected to the output of the second inverter (i2) via the channel of a fifth transistor (t5);

the interrogation pulses (as) are applied to a pulse shaper (if) which produces two nonoverlapping clock signals (f, f) therefrom;

the first clock signal (f) is applied to the gates of the fourth and fifth transistors (t4, t5), and

the second clock signal (f) is applied to the gate of the first transistor (t1).

4,518,873

BUFFER CIRCUIT FOR DRIVING A C-MOS INVERTER

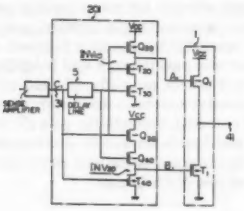
Yasuo Suzuki, Yokohama; Hiroshi Hirao, Kawasaki, and Masanori Nagasawa, Kamakura, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

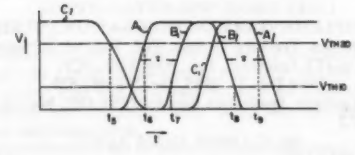
Filed Aug. 13, 1982, Ser. No. 407,953

Claims priority, application Japan, Aug. 13, 1981, 56-125981

Int. Cl.³ H03K *17/284, 17/26, 17/687, 17/16*

U.S. Cl. 307—451 **9 Claims**





1. A buffer circuit, operatively connected to receive an input signal, for driving a C-MOS inverter having first and second transistors, said buffer circuit comprising:

first and second inverters operatively connected between a power supply line and ground and operatively connected to receive the input signal, for inverting the input signal and for providing an output signal for driving the first and second transistors in the C-MOS inverter, said first inverter having a first output terminal operatively connected to the first transistor and comprising at least one first switching delay transistor operatively connected in series between the power supply line and ground, said second inverter having a second output terminal operatively connected to the second transistor and comprising at least one second switching delay transistor operatively connected in series between the power supply line and ground;

delay means, operatively connected to said first and second inverters and operatively connected to receive the input signal, for providing a delay signal having a predetermined delay time with respect to the input signal; and

said first and second switching delay transistors receiving the delay signal from said delay means, having a predetermined delay time with respect to the input signal to prevent simultaneous conduction of current through the first and second transistors in the C-MOS inverter.

4,518,874

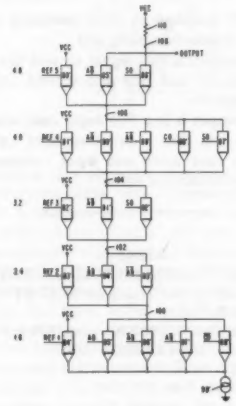
CASCODED PLA ARRAY

James W. Davis, Boca Raton, Fla., and Frank D. Jones, Wallkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 236,390, Feb. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 22,589, Mar. 21, 1979, abandoned. This application Jan. 20, 1984, Ser. No. 572,322

Int. Cl.³ H03K *19/086, 19/092, 19/177;* **H01L** *27/10*

U.S. Cl. 307—467 **14 Claims**



1. A bipolar transistor integrated circuit comprising:

a first horizontally elongated, isolated epitaxial region in a semiconductor substrate;

a second horizontally elongated, isolated epitaxial region in said substrate;

a first plurality of common collector bipolar transistors formed in a spaced, horizontal row in said first epitaxial region which forms the common collectors thereof, with selected ones of said plurality having their emitters connected in common to a first current source;

a second plurality of common collector bipolar transistors formed in a spaced, horizontal row in said second epitaxial region which forms the common collectors thereof, with selected ones of said second plurality having their emitters connected in common to said first epitaxial region and each of said second plurality of transistors being vertically aligned with a respective one of said first plurality of transistors;

the bases of said vertically aligned transistors from said first and said second epitaxial regions being selectively connected to vertically oriented input signal lines;

said second epitaxial region being connected to an output mode;

a third vertically elongated, isolated epitaxial region in said substrate;

a plurality of common collector bipolar transistors formed in a spaced, vertical row in said third epitaxial region which forms the common collectors thereof, with a first one of said plurality having its emitter connected in common

with said emitters of said selected ones of said plurality of transistors in said first epitaxial region and being vertically aligned therewith, a second one of said plurality of transistors in said third epitaxial region having its emitter connected in common with said emitters of said selected ones of said second plurality of transistors in said second epitaxial region and being vertically aligned therewith;

said first one of said transistors in said third epitaxial region serving as a reference transistor for said selected ones of said plurality of transistors in said first epitaxial region, being connected in a current switched logic configuration;

said second one of said plurality of transistors in said third epitaxial region serving as a reference transistor for said selected ones of said second plurality of transistors in said second epitaxial region, connected in a current switched logic configuration;

whereby a cascode connected logic array is formed.

4,518,875

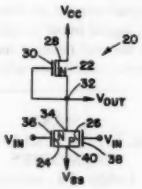
THREE-LEVEL MOS LOGIC CIRCUIT

Haluk M. Aytac, P.O. Box 10117, Berkeley, Calif. 94709

Continuation-in-part of Ser. No. 385,072, Jun. 4, 1982, abandoned. This application Sep. 22, 1983, Ser. No. 534,269

Int. Cl.³ H03K *19/20, 19/094*

U.S. Cl. 307—473 **8 Claims**



1. A three-level logic circuit comprising:

an MOS load device connected to a first voltage supply;

an input logic element comprised of at least one pair of P-channel and N-channel enhancement type complementary MOS devices and connected at a node to said load device and said element further connected to a second voltage supply at a different level;

logic input means to said input logic element and an output at said node;

wherein the absolute value of said N-channel MOS device threshold voltage is greater than the absolute value of said P-channel MOS device threshold voltage when said first voltage supply is algebraically greater that the said second voltage supply and conversely, the absolute value of said N-channel MOS device threshold voltage is less than the absolute value of said P-channel MOS device threshold voltage when said first voltage supply is algebraically less than said second voltage supply;

whereby inputs to said logic input means at three predetermined voltage levels will produce active logic outputs at three different voltage levels from said node.

4,518,876

TTL-ECL INPUT TRANSLATION WITH AND/NAND FUNCTION

Ion Constantinescu, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 30, 1983, Ser. No. 480,994

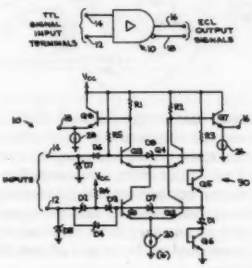
Int. Cl.³ H03K *19/092, 19/086;* **H03F** *3/45*

U.S. Cl. 307—475 **17 Claims**

1. A circuit for converting the voltage levels of at least a pair of signals provided by transistor-transistor-logic (TTL) circuits to voltage levels that are compatible with emitter-coupled logic (ECL) circuitry and for performing a logic function on said signal pair, comprising:

first and second input terminals for respectively receiving the pair of TTL signals;

a first pair of transistors having their emitter terminals coupled to a current source, a first base terminal of a first transistor of said first pair being coupled to the first input terminal for receiving one of the TTL signals; a second pair of transistors having their emitter terminals coupled to a collector terminal of the first transistor of the first pair, a base terminal of a first transistor of the second pair being coupled to the second input terminal, a collector terminal of a second transistor of the second pair being coupled to a collector terminal of the second transistor of the first pair, the collector terminals of the second transistors being further coupled to a first voltage supply terminal, the collector terminal of said first transistor of said second pair being coupled to said first voltage supply terminal;



means for generating a first and a second reference voltage, a base terminal of the second transistor of the first pair being coupled to the generating means for receiving the first reference voltage, a base terminal of the second transistor of the second pair being coupled to the generating means for receiving the second reference voltage; an output terminal being coupled to the collector terminal of the second transistor of the second transistor pair and

two series-connected diodes, each having their anode terminals connected to one another, coupling the first input terminal to the base terminal of the first transistor of the first pair.

4,518,877

PRECISION ABSOLUTE VALUE AMPLIFIER FOR A PRECISION VOLTMETER

William E. Hearn, Berkeley, and Donald J. Rondeau, El Sobrante, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1982, Ser. No. 435,157

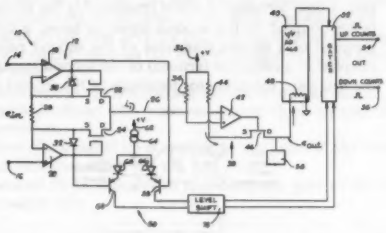
Int. Cl.³ H03K *5/22;* **G06G** *7/12*

U.S. Cl. 307—490 **11 Claims**

1. An absolute value amplifier for a precision voltmeter or the like, comprising first and second differential input amplifier devices having plus and minus inputs, said plus inputs affording bipolar input terminals for said amplifier, a gain determining resistor connected between said minus inputs of said differential input amplifier devices, first and second diodes connected between the respective minus inputs and the respective outputs of said differential input amplifier devices, an output terminal for said amplifier, first and second transistors having respective output connections connected between the respective minus inputs and said output terminal, said transistors having respective input connections connected to the respective outputs of said amplifier devices, and load means for supplying output

current to said output terminal, said output current being proportional to the absolute value of the input voltage between said input terminals,

said load means comprising a load resistor connected between said output terminal and a voltage source, said amplifier comprising a third differential amplifier device having a plus input connected said output terminal, said third differential amplifier device having a minus input, a second gain determining resistor connected between said last-mentioned



minus input and said voltage source, feedback means connected between the output of said third differential amplifier device and said minus input, and output means connected to the output of said third differential amplifier device,

said feedback means comprising a third transistor having output connections between said last-mentioned minus input and said output means, said third transistor having an input connection connected to the output of said third differential amplifier device.

4,518,878

"ALL-PASS" FILTER CIRCUIT INCLUDING AN INTEGRABLE BAND-PASS FILTER CIRCUIT

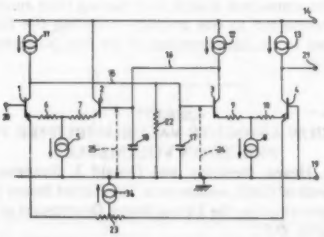
Kenneth W. Moulding, Horley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 12, 1982, Ser. No. 433,610

Claims priority, application United Kingdom, Oct. 30, 1981, 8132756

Int. Cl.³ H03H *11/08, 11/18*

U.S. Cl. 307—520 **7 Claims**



1. An all-pass filter circuit having a circuit arrangement comprising a first long-tailed pair of first and second transistors, a second long-tailed pair of third and fourth transistors, a first load impedance connected between a first supply potential node and an output electrode of one transistor of the first pair, second and third load impedances connected, respectively, between second and third supply potential nodes and output electrodes of the third and fourth transistors, respectively, an output electrode of the other transistor of said first pair being connected to a fourth supply potential node, a first means for coupling said first load impedance to a control electrode of one transistor of the second pair, a second means for coupling said second load impedance to a control electrode of said second transistor, first and second capacitive elements connecting said first and second coupling means, respectively, to a first reference potential node so that a first voltage-to-current converter, including said one transistor of the second pair, couples said first capacitive element to said second capacitive element and a second voltage-to-current converter, including said second transistor, couples said second capacitive element to said first capacitive element, the signal path through one of the said converters passing through only one transistor of the corresponding pair so that said one converter is inverting, the signal path through the other of said converters passing through both transistors of the corresponding pair so that said other of said converters is non-inverting, a third means for coupling a signal input to a control electrode of said first transistor so that a first amplifier, including said first transistor, couples said signal input to said first capacitive element, a fourth means for coupling a second reference potential node to a control electrode of the other transistor of the second pair, a fifth means for coupling said third load impedance to a signal output so that a second amplifier, including said fourth transistor, couples said first capacitive element to said signal output, and a resistor included in parallel with said capacitive element, characterized in that said all-pass filter circuit further comprises a second resistor connecting a common electrode of a transistor, included in the signal path from said signal input to the output electrode of said first transistor, to a common electrode of a transistor, which is included in the signal path from the second reference potential node to the output electrode of said other transistor of the second pair, and which has its output electrode connected to said signal output, so that a non-inverting signal path exists from said signal input to said signal output via said second resistor, said second resistor having a value such that the circuit arrangement constitutes said "all-pass" filter circuit.

4,518,879

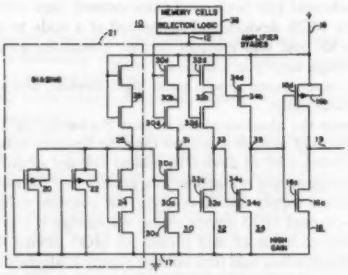
STABLE RAIL SENSE AMPLIFIER IN CMOS MEMORIES

Richard M. Greene, Ambler, Pa., assignor to Solid State Scientific, Inc., Willow Grove, Pa.

Filed Aug. 31, 1983, Ser. No. 528,096

Int. Cl.³ H03K *5/19;* **G11C** *7/06;* **G01R** *19/165;* **H03F** *3/18*

U.S. Cl. 307—530 **9 Claims**



1. A stable rail FET sense amplifier in a CMOS chip memory for sensing small output voltage swings from an output of said memory, said memory output voltage swings being at a level that is substantially or very close to the level of a voltage supply rail of said memory circuit, comprising means for shifting the voltage level of said memory voltage swings to substantially the center of the voltage range between the levels of said supply voltage rail and a reference voltage rail, said shifting means being comprised of a plurality of cascaded level shifting stages, an output of said memory being connected to the input of the first of said cascaded stages, each of said stages being capable of contributing to said shifting and each of said stages having a relatively small amount of gain or loss, and a bias reference means being coupled to said first stage for determining the level of said voltage range center; and high gain ampli-

fier means coupled to the output of the last of said cascaded stages for providing a relatively high gain to the signal at said last stage output.

4,518,880

MOS SWITCH CIRCUIT WITH CONSISTENT LOW ON RESISTANCE

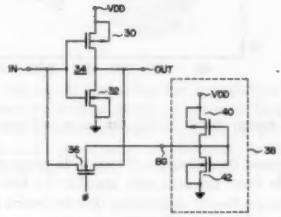
Eiji Masuda, Kawasaki, and Kenji Matsuo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

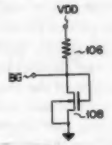
Filed Feb. 25, 1983, Ser. No. 469,971

Claims priority, application Japan, Feb. 26, 1982, 57-29938; Feb. 26, 1982, 57-29966

Int. Cl.³ H03K *17/687, 17/12, 17/04, 17/30*

U.S. Cl. 307—577 **5 Claims**





1. An MOS switch circuit with low ON resistance with low-variation, which comprises:

a first MOS transistor switch having source and drain electrodes connected to input and output terminals of the switch circuit, respectively, and also having gate and back gate electrodes, the on/off state of the first MOS transistor switch being controlled by a control signal supplied to the gate electrode thereof; and

biasing means, including a second MOS transistor switch having a channel type the same as the channel type of the first MOS transistor switch, for supplying a voltage corresponding to a threshold voltage of the second MOS transistor switch to the back gate of the first MOS transistor switch.

4,518,881

LINEAR MOTOR

Joseph J. Stupak, Jr., San Pedro, Calif., assignor to Ibis Systems, Inc., West Lake Village, Calif.

Filed Oct. 25, 1982, Ser. No. 436,324

Int. Cl.³ H02K *33/02*

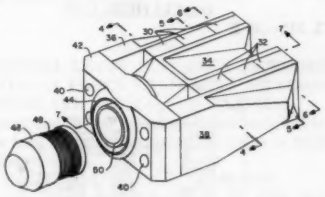
U.S. Cl. 310—13 **12 Claims**

1. A linear motor comprising

a center pole of magnetic material including a front generally cylindrical portion and a back portion,

an outer pole of magnetic material including first and second side members and a front portion, said side members being affixed to said front portion for transmission of magnetic flux, said front portion having a generally cylindrical opening with said front center pole portion positioned therein and defining a generally cylindrical gap between said front portion of said outer pole and said front portion of said center pole,

said side members of said outer pole and said back portion of said center pole being tapered (near the outer edges thereof) with the cross-sections of said side members being largest near said front portions and decreasing away from said front portions to facilitate uniform flux transmission, said side members and said back portion being tapered near the edges thereof to minimize magnetic flux leakage back to said magnet means,



a bobbin having generally cylindrical inner and outer surfaces positioned in said generally cylindrical gap, said bobbin including a coil, and

first and second generally planar magnet means supported between said back portion of said center pole and said first and second side members, respectively, with said first and second magnet means being in spaced and generally parallel alignment thereby defining magnetic paths through said side members to said front portion of said outer pole, across said generally cylindrical gap, and to said center pole.

4,518,882

ELECTROMAGNETIC LINEAR DRIVING DEVICE

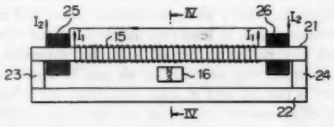
Seiji Morino, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 1, 1983, Ser. No. 510,303

Claims priority, application Japan, Jul. 12, 1982, 57-119848

Int. Cl.³ H02K *33/00*

U.S. Cl. 310—15 **8 Claims**



1. An electromagnetic linear driving device comprising:

a first magnetic member having a longitudinal axis defining a longitudinal direction which member forms at least a portion of a magnetic circuit path;

a first winding wound around a central portion of said stationary magnetic member along said longitudinal direction for inducing, responsive to a first current flowing therein, a first magnetic flux in said magnetic circuit;

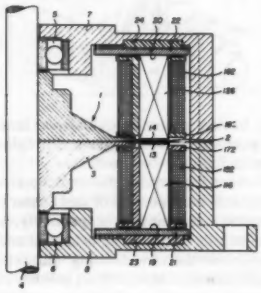
a second winding, wound around a terminal portion of said stationary magnetic member apart from said central portion thereof, for inducing, responsive to a second current flowing therein, a second magnetic flux in said stationary magnetic member, which second flux opposes said first magnetic flux; and

a first permanent magnet having north (N) and south (S) poles defining a N-S axis, movable along a path substantially parallel to said longitudinal direction and along said central portion of said stationary magnetic member, for generating a magnetic flux linking at least some turns of said first winding, the N-S axis being substantially perpendicular to said longitudinal axis.

4,518,883
ELECTRIC MOTOR WITH PERMANENT MAGNET ROTOR

Claude Oudet, Besancon, France, assignor to Portescap, La Chaux de Fonds, Switzerland

PCT No. PCT/CH82/00127, § 371 Date Aug. 3, 1983, § 102(e) Date Aug. 3, 1983, PCT Pub. No. WO83/02042, PCT Pub. Date Jun. 9, 1983
PCT Filed Dec. 3, 1982, Ser. No. 530,585
Claims priority, application Switzerland, Dec. 4, 1981, 7766/81
Int. Cl.³ H02K *1/18*
U.S. Cl. 310—49 R 18 Claims

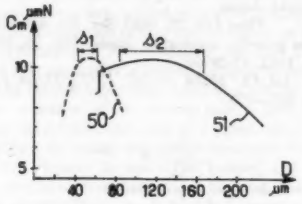


1. An electrical stepper motor comprising on the one hand a permanently magnetized rotative part which is mounted on the motor shaft and presents a rotatory symmetry about the same, this part having a small thickness as compared to its outer diameter and being magnetized in the direction of its thickness so as to present on each of its opposite faces 2N magnetic poles of alternating polarity, N being a natural number, these poles being arranged regularly along an annular zone, and comprising on the other hand, at least one magnetic stator circuit and at least two electric coils coupled with this magnetic circuit, each circuit comprising at least one air gap in which the magnetized part is placed, and at least two polar parts having an axial plane of symmetry and being arranged for co-operation with the magnetic poles of the magnetized part, characterized in that each magnetic stator circuit (**9**, **10**, . . .) comprises a first (**91**) and a second (**92**) group of polar parts including each at least two polar parts (**111**, **112**; **115**, **116**), the axial planes of symmetry of the polar parts of each group forming between each other at least approximately an angle of $2k\pi/N$, k being a natural number, and the respective axial planes of symmetry of a polar part (**111**) of the first group and of a polar part (**115**) of the second group forming between each other at least approximately an angle of $(2r+1)\pi/N$, r being a natural number, the polar parts of said first group being coupled with at least one of said coils (**151**) and the polar parts of said second group being coupled with at least one other of said coils (**152**), the coils coupled respectively with polar parts of the two groups producing, in response to a given exciting current, magnetic fields having in the transversal direction of the magnetized part, opposite directions for each of the two groups, each magnetic stator circuit comprising or being coupled with two yoke parts (**21**, **22**) placed on either side of the magnetized part (**2**), so that the magnetic field produced in these circuits is substantially within the two space portions extending respectively above the magnetic poles of each face of the magnetized part.

4,518,884
STEP MOTOR PARTICULARLY FOR ELECTRONIC TIMEPIECES

Jean C. Chatelain, Beure, France, assignor to Centre Technique de l'Industrie Horlogere "Cetehor", France

Filed Jan. 20, 1984, Ser. No. 572,432
Claims priority, application France, Apr. 18, 1980, 8008807
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—49 3 Claims



1. A step motor particularly for an electronic timepiece, comprising

a stator formed by assembly of two pole piece parts having free ends bent towards one another to form two pole pieces, respectively, delimiting therebetween an air-gap;

an exciting coil associated with the stator;

a rotor consisting of a permanent magnet having a predetermined radius accommodated in said air-gap, the free end of each pole piece having a recess substantially cylindrical in shape such that the axis of each said recess is substantially parallel to the axis of rotation of said rotor, each of said recesses having a radius, said pole pieces being shiftable with respect to one another in a direction perpendicular to the main direction of the magnetic flux generated by said coil without a shift of said pole pieces, the portions of said pole pieces facing one another having substantially the same shape, wherein the value of the ratio of the mean air-gap to the radius of said rotor is between 0.7 and 1 and the value of the shift of said two pole pieces with respect to said main direction of said magnetic flux being variable between 80 and 200 microns when said radius of said rotor is in the order of 800 microns, without prejudice to ensuring correct operation of said motor, to permit an increase of the manufacturing and adjustment tolerances; and

displacement means for displacing at least one of said pole pieces with respect to the other, in one direction or the plane perpendicular to the axis of rotation of said rotor, to reverse the direction of rotation of said rotor and to permit manual adjustment of said motor.

4,518,885
SUPERCONDUCTING ROTOR WITH VAPOR COOLED CRYOGENIC LEADS HAVING A REGENERATOR PORTION

Phillip W. Eckels, Penn Hills, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 16, 1984, Ser. No. 571,263
Int. Cl.³ H02K *9/16*
U.S. Cl. 310—52 3 Claims

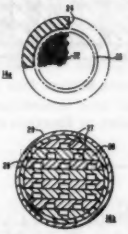
1. A superconducting rotor comprising:

a superconducting rotor winding within a rotatable chamber, means for supplying a liquified coolant to said chamber to cool said rotor winding, one or more normal electrical conductors having a first end connected with said superconducting field winding within said chamber and a second end located external of said chamber for supplying excitation to said winding;

said one or more conductors each having an inner portion comprising a conductive element with vapor transfer passages for transferring out of said chamber vapor gener-

ated from coolant therein and for cooling said conductive element by said vapor as it is transferred; and,

each of said conductors having a regenerator portion, extending external of said chamber, comprising a conductive member of a thermal mass that is greater than that of said



transferred vapor, including that transferred during fault conditions, by at least about an order of magnitude, said conductive member of said regenerator portion having vapor transfer passages communicating with said vapor transfer passages of said conductor inner portion.

4,518,886

CHARGING GENERATOR HAVING WATERPROOF COVER

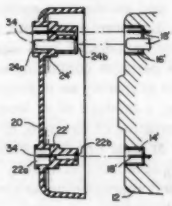
Kazutoshi Kaneyuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,047

Claims priority, application Japan, Jan. 27, 1982, 57-10455[U]

Int. Cl.³ H02K *5/10*

U.S. Cl. 310—71 **4 Claims**



1. A charging generator comprising:

a main body of said charging generator;

an externally connecting terminal unit having male terminal unit terminals on said main body;

a waterproof cover for covering at least said externally connecting terminal unit;

a bracket on said main body, said terminal unit being disposed on said bracket, said waterproof cover comprising a waterproof cup-shaped cover of an electrically unsulating material, having an open end for facing said bracket, for being positioned over and fixed to said bracket to substantially cover the same;

an externally connecting connector unit on said waterproof cover; and

a plurality of fitting terminals fixedly inserted into said connector unit on said cover for directly connecting said externally connecting terminal unit to said connector unit when said waterproof cover is covering said terminal unit;

said externally connecting connector unit including a first connector housing subunit and a second connector housing subunit, respectively extending toward and away from said terminal unit when said waterproof cover is covering said terminal unit, opposite ends of said fitting terminals being respectively disposed in said first and second connector housing subunits; and

each of said fitting terminals including a male terminal portion at the end thereof disposed in said second subunit and a female terminal portion at the end thereof disposed in said first subunit, the male terminal portions of said fitting terminals being exposed for external connection, said first subunit being insertable into said terminal unit to electrically connect the male terminal portions of said fitting terminals to said terminal unit terminals when said cover is covering said terminal unit.

4,518,887

DIFFERENTIAL LEVER ACTUATOR INCLUDING DIFFERENTIALLY FORCE-TRANSMITTING MEMBERS WHICH ARE NOT LIABLE TO BREAK

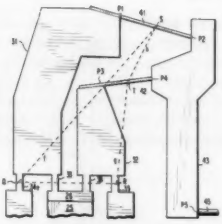
Takeshi Yano; Izumu Fukui; Takeshige Hamatsuki; Eiichi Sato, and Osamu Inui, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,667

Claims priority, application Japan, Feb. 25, 1983, 58-30284; Jun. 14, 1983, 58-106211; Jul. 21, 1983, 58-133340; Oct. 11, 1983, 58-189530; Dec. 9, 1983, 58-232326

Int. Cl.³ H01V *7/00*

U.S. Cl. 310—328 **12 Claims**



1. In a differential lever actuator comprising a driving member having an axis, a first end fixed to a base member, and a second end susceptible to a linear displacement along said axis, first and second lever members attached to said base member at first and second fulcrum points, respectively, and to said second end at first and second power points, respectively, first and second plate-shaped resilient power transmission members having principal surfaces perpendicular to a reference plane including said axis and said first and said second power points and attached to said first and said second lever members at first and second weight points, respectively, and a differential lever member carried by said first and said second transmission members at first and second predetermined points, respectively, wherein said first and second fulcrum points, said first and second power points, said first and second weight points, and said first and second predetermined points are arranged to satisfy the following equation:

$$\frac{\phi_2}{\phi_1} = \frac{\frac{c}{g}\,\mathrm{Sin}\phi(e,f) - \mathrm{Sin}(\phi(e,g) - \phi(e,f))}{\frac{c}{f}\,\mathrm{Sin}\phi(e,f) - \mathrm{Sin}(\phi(e,g) - \phi(e,f))}$$

where

e: the distance between the first and second fulcrum points

f: the distance between the first fulcrum point and the midpoint between the first weight point and the first predetermined point (first midpoint)

g: the distance between the second fulcrum point and the midpoint between the second weight point and the second predetermined point (second midpoint)

$\phi(e,f)$: an angle which is measured counterclockwise from the line including the first and second fulcrum points to

the line including the first fulcrum point and the first midpoint

$\phi(e,g)$: an angle which is measured counterclockwise from the line including the first and second fulcrum points to the line including the second fulcrum point and the second midpoint

ϕ_1: an increment angle added to the angle $\phi(e,f)$

ϕ_2: an increment angle added to the angle $\phi(e,g)$

$$\phi_2/\phi_1 = l_1/l_2$$

where

l_1: the distance between the first fulcrum point and the first power point

l_2: the distance between the second fulcrum point and the second power point.

4,518,888

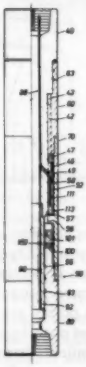
DOWNHOLE APPARATUS FOR ABSORBING VIBRATORY ENERGY TO GENERATE ELECTRICAL POWER

Clarence J. Zabcik, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,333

Int. Cl.³ G01V *1/40;* **E21B** *17/07*

U.S. Cl. 310—334 **22 Claims**



18. Apparatus for use in a drill string operating in a borehole, comprising:

means for converting oscillating rotational and longitudinal motion occurring in said drill string into electrical energy;

downhole electrically operated means; and

means for transmitting said electrical energy to said downhole electrically operated means.

4,518,889

PIEZOELECTRIC APODIZED ULTRASOUND TRANSDUCERS

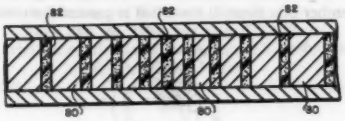
Pieter J. 'T Hoen, Mission Viejo, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,558

Int. Cl.³ H04R *17/00;* **H01L** *41/08*

U.S. Cl. 310—357 **11 Claims**

5. An apodized ultrasound transducer comprising a body of piezoelectric material which is polarized in a direction substantially perpendicular to a surface of the body and wherein the polarization decreases as a function of distance from a central line or point on the surface wherein, as an improvement, the body comprises a matrix of substantially parallel rods of piezoelectric ceramic which are embedded in and isolated from one another by an electrically inert binder and are polarized in a direction parallel to their length and wherein the distance between the rods varies as function of the distance from the center line or point.



4,518,890

IMPREGNATED CATHODE

Sadanori Taguchi, Tokyo; Toshiyuki Aida, Chofu; Shigehiko Yamamoto, Tokorozawa, and Yukio Honda, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1983, Ser. No. 456,247

Claims priority, application Japan, Mar. 10, 1982, 57-36412

Int. Cl.³ H01J *1/14, 19/06;* **H01K** *1/04*

U.S. Cl. 313—346 R **16 Claims**

1. An impregnated cathode which comprises a porous refractory substrate and an electron emissive material impregnated into pores in the pourous substrate, wherein said pourous refractory substrate includes at least one of scandium oxide particles and oxide particles containing scandium.

10. A process for preparing an impregnated cathode which comprises sintering a mixture of at least one metal selected from the group consisting of tungsten, molybdenum, tantalum and rhenium, and at least one of scandium oxide and oxide particles containing scandium, to thereby form a heat-resistant, porous substrate; and impregnating an electron emissive material into pores of the porous substrate.

4,518,891

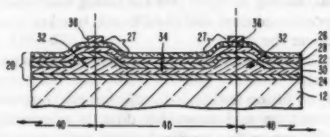
RESISTIVE MESH STRUCTURE FOR ELECTROLUMINESCENT CELL

Webster E. Howard, Jr., Yorktown Hgts., N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,483

Int. Cl.³ H01J *31/10, 29/28, 1/70*

U.S. Cl. 313—398 **14 Claims**



1. An array of electroluminescent cells for displaying data wherein each said electroluminescent (EL) cell includes a transparent conductor, a first insulator layer thereon, a layer of luminescent material on said first insulator layer, a second insulator layer applied to said luminescent material layer, a

second conductive layer applied to said second insulator layer, said EL cell having the improvement comprising:

each said EL cell having a substantially planar first region substantially parallel to said transparent conductor wherein luminance level is alterable, and a second region surrounding and substantially coplanar with said first region, said second region being nonluminous; and

said luminescent material layer being continuous across said first and second regions; and

said second conductive layer having a predetermined resistivity overlaying said second insulator layer to reduce damage to said luminescent layer due to defects in said EL cell structure.

4,518,892

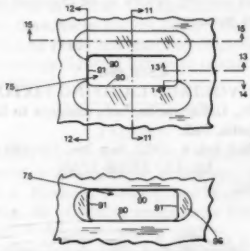
TELEVISION PICTURE TUBE WITH APERTURE MASK HAVING RECESSES THEREIN

Roland Thoms, Mullheim, Fed. Rep. of Germany, assignor to Buckbee Mears Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 343,149, Jan. 28, 1982, Pat. No. 4,389,592, which is a continuation of Ser. No. 148,682, May 12, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 416,571

Int. Cl.³ H01J *29/07*

U.S. Cl. 313—403 **5 Claims**



1. A color television tube comprising:

an enclosure having a viewing surface on one end with a plurality of phosphor regions for generating light of three primary colors on the viewing surface of said enclosure, at least one electron gun to excite said phosphor regions;

an aperture mask located proximate said viewing surface, said aperture mask having a plurality of line of sight openings with a recess located therearound, said recess having a center portion and end portions and characterized by having a depth which is greater at the center portion of said recess than at the ends of said recess, said aperture mask having a first side and a second side, said aperture mask first side having surfaces which define an outline of a portion of a line of sight opening located proximate said first side of said aperture mask;

said aperture mask second side having surfaces which define an outline of a portion of a line of sight opening located proximate said second side of said aperture mask so that a line of sight opening of said plurality of line of sight openings comprises an aperture for electrons to pass through which is partially bounded by said surfaces proximate said aperture mask first side and partially bounded by said surfaces proximate said aperture mask second side, said aperture mask positioned between said electron gun and said phosphor regions with said aperture mask first side facing said viewing surface and said aperture mask second side facing said electron gun to thereby permit said second side of said mask to act as a shield to prevent electrons from impinging on the improper phosphor region.

4,518,893

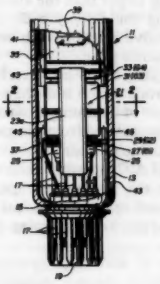
CRT WITH INTERNAL NECK COATING OF CRYSTALLINE TIN OXIDE FOR SUPPRESSING ARCING THEREIN

James Kane, Lawrenceville, and John Murr, Jr., Allentown, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 23, 1982, Ser. No. 443,921

Int. Cl.³ A01J *29/88;* **B05D** *5/12*

U.S. Cl. 313—479 **9 Claims**



1. In a cathode-ray tube comprising an evacuated glass envelope, an electron-gun mount assembly housed in said envelope, electrodes of said mount assembly being confined by closely-spaced glass surfaces, and an electrically-conductive coating on said glass surfaces opposite electrodes of said mount assembly, the improvement wherein said coating is a smooth film consisting essentially of crystalline tin oxide, and is floating electrically.

4,518,894

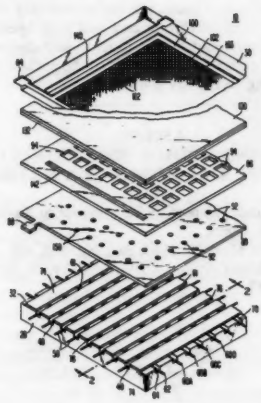
DISPLAY PANEL HAVING MEMORY

Nicholas C. Andreadakis, Branchburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 6, 1982, Ser. No. 395,696

Int. Cl.³ H01J *17/04, 61/04, 61/54*

U.S. Cl. 313—491 **3 Claims**



1. A gas-filled memory display panel comprising

a gas-filled envelope made up of a base plate and a face plate hermetically sealed together,

a layer of rows and columns of scan/address cells disposed adjacent to said base plate, each scan/address cell compris-

ing a volume of gas and an anode electrode and a cathode electrode,

a layer of rows and columns of display cells adjacent to said layer of scan/address cells, said display cells having as their components:

a first apertured plate electrode disposed adjacent to said layer of scan/address cells, the apertures in said first apertured plate electrode being small holes each in operative relation with a scan/address cell,

a second apertured plate seated on said first plate with its apertures being larger than the apertures in said first plate and comprising the display cells of the panel and each being in operative relation with one of the apertures in said first apertured plate,

the face plate carrying on its inner surface a large-area apertured A.C. electrode which is in the nature of a mesh and is covered by a layer of insulating material whereby said apertured electrode is insulated from the gas in the panel and thus operates as an A.C. electrode,

the apertures in said A.C. apertured electrode being considerably smaller than the display cell apertures in said second apertured plate and so numerous that the eye sees substantially all light output from a display cell which is emitting light,

the solid portions of said A.C. apertured electrode which define the apertures therein comprising fine conductors which are parallel to each other but are disposed at an angle to the rows and columns of display cells, so that the rows and columns of apertures in said A.C. mesh electrode are disposed at an angle to the rows and columns of display cells, the combination of the angular orientation of said solid portions of said A.C. electrode and the presence of large numbers of apertures therein for each display cell making it unnecessary to critically align said A.C. electrode and said second apertured plate and its display cells,

said A.C. electrode serving as a sustaining electrode and having sustaining signals coupled between it and said first conductive plate whereby said A.C. electrode serves both to apply electrical sustaining signals to said display cells and to provide aperture definition for said display cells,

said scan/address cells being adapted to be scanned sequentially column by column, with selected cells being energizable at the same time to cause excited particles therein to flow through apertures in said first apertured plate and into the associated display cell in said second apertured plate and onto the walls thereof to form wall charge which combines with said sustaining signals, applied across said display cells between said A.C. electrode and said first apertured plate electrode, to cause and sustain glow in said display cells, all of the display cells energized in all of the columns of display cells combining to display a message.

4,518,895

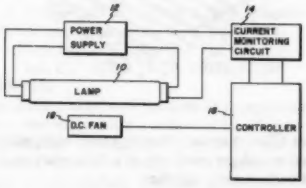
MECHANISM AND METHOD FOR CONTROLLING THE TEMPERATURE AND OUTPUT OF A FLUORESCENT LAMP

Richard F. Lehman, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1983, Ser. No. 478,749

Int. Cl.³ H01J *7/24, 13/32, 17/28, 19/74, 61/52*

U.S. Cl. 315—117 **2 Claims**



1. A monitoring and control mechanism for optimizing the light output of a fluorescent lamp containing an excess of mercury at a cold spot therein, said mechanism comprising:

a power supply for applying operating current to said lamp, said operating current at normal lamp operation corresponding to a minimum current level associated with an optimum cold spot temperature,

a monitoring means for detecting an increase in lamp current and generating a signal indicative thereof,

a temperature control device placed in proximity to said cold spot, said device, when operational, lowering the temperature of the cold spot and, when non-operational, effectively permitting the cold spot temperature to rise, and

a controller circuit adapted to change the operational state of said temperature control device in response to the output signals from said monitoring means.

2. A method of optimizing the light output of a fluorescent lamp containing an excess of mercury at a cold spot thereon comprising the steps of

determining the lamp current level corresponding to an optimum cold spot temperature and lamp light output,

monitoring the current level of said lamp,

modifying the temperature at said cold spot by means of a cooling device having an active (cooling) mode of operation and an inactive (inoperative) mode of operation, and

generating an electrical signal responsive to an increase of monitored current level, causing the instant mode of operation of said cooling device to be changed in response to said current increase.

4,518,896

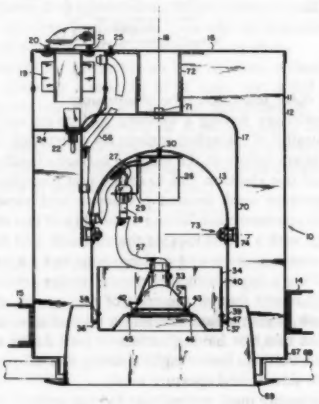
DUAL VOLTAGE LIGHTING FIXTURE

Earl F. Miles, Jr., Indianapolis, Ind., assignor to Indy Lighting, Inc., Indianapolis, Ind.

Filed Jul. 6, 1982, Ser. No. 395,497

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—162 **6 Claims**



1. A dual voltage lighting fixture for permitting the ready use of light bulbs having different operating voltages, comprising:

a housing;

a shade directing means including a yoke rotatably mounted to said housing;

a beam-directing shade pivotably mounted to said yoke;

a lamp supply means mounted to said housing and being for receiving an electrical current at a single supply voltage and providing electrical current at a first output voltage and a second output voltage different from the first output voltage;

a mating connector plug including male and female members, one of said male and female members mounted within said beam-directing shade and electrically connected to said lamp supply means to receive electrical current at said second output voltage;

a first light bulb socket fixedly mounted within said beam-directing shade and adapted to operatively receive therein a first light bulb having an operating voltage corresponding to said first output voltage;

a light fixture including a plurality of spring mounting clips resiliently urging against said beam-directing shade so as to fasten said light fixture within said beam-directing shade and permit removal therefrom by pressing said clips inwardly away from said shade, said light fixture including a second light bulb socket electrically connected to the other of said male and female connector plug members and positioned directly below said first light bulb socket, said second light bulb socket adapted to operatively receive therein a second light bulb having an operating voltage corresponding to said second output voltage, said second light bulb sufficiently different in size from said first light bulb to preclude substitution of said first light bulb in said second light bulb socket, and vice versa; and

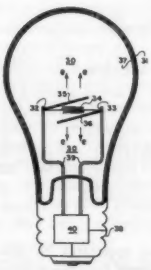
a switch means mounted to said housing and electrically connected to said lamp supply means for switching electrical current from said supply means to either said first light bulb socket or said second light bulb socket, whereby, only one of said first and second light bulbs is operational in said dual voltage lighting fixture at any time, said detachable fixture being detached from said beam-directing shade and removed from the remainder of said dual voltage lighting fixture to render said first light-bulb operational.

4,518,897

TWIN ANODE BEAM MODE FLUORESCENT LAMP

Joseph M. Proud, Wellesley Hills; A. Bowman Budinger, Westford; Leslie A. Riseberg, Sudbury, and Wojciech W. Byszewski, Arlington, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 336,971
Int. Cl.³ H05B *41/16, 41/24*
U.S. Cl. 315—260 **10 Claims**



1. A beam mode fluorescent lamp comprising:

a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;

a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;

a thermionic cathode having proper resistance located within said envelope for emitting electrons, said cathode having first and second ends;

a first and a second anode, each of said anodes located within said envelope for accelerating electrons and alternately forming corresponding first and second electron beams in response to a voltage applied between said anodes and said cathode, each of said anodes being spaced apart from said cathode by a distance which is preferably less than the electron range in said fill material and having a structure which permits said electron beams to pass therethrough;

said first anode being connected to said first end of said cathode and disposed at an upward angle with respect to said cathode and said second anode being connected to said second end of said cathode and disposed at a downward angle with respect to said cathode and parallel to said first anode;

first and second drift regions, each located within said envelope through which said first and said second electron beams drift after passing through said first and said second anodes respectively, each of said drift regions having a dimension in the direction of travel of said respective electron beam which is greater than the electron range in said fill material, so that the electrons in each of said electron beams collide with the atoms of said fill material in said respective drift region, thereby causing excitation of a portion of said fill material atoms and emission of ultraviolet radiation and causing ionization of another portion of said fill material atoms and emission of secondary electrons, said secondary electrons causing emission of additional ultraviolet radiation;

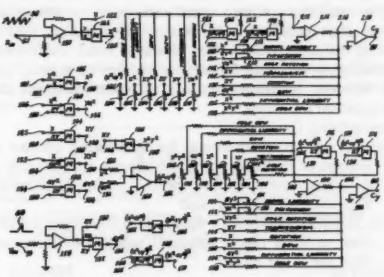
a power source external to said envelope; and means for connecting said cathode and each of said anodes to said power source.

4,518,898

METHOD AND APPARATUS FOR CORRECTING IMAGE DISTORTIONS

Andrew A. Tarnowski, New Caanan, and Brian G. Anderson, Fairfield, both of Conn., assignors to Image Graphics, Incorporated, Fairfield, Conn.

Filed Feb. 22, 1983, Ser. No. 468,045
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—371 **23 Claims**



1. In an electron beam recording apparatus having means for deflecting a charged particle beam in the X and Y direction therein, the method for improving the geometric fidelity of the reproduced image comprising the steps of:

(a) positioning a charged particle sensitive medium in the path of a charged particle beam to retain a permanent image on said medium,

(b) projecting the particle beam to form on said medium a test pattern having a predetermined configuration,

(c) providing a reference alignment image,

(d) dividing each of the X_{in} and Y_{in} signals into a plurality of non-interactive parallel correction circuits with each arranged to produce a correction signal for a predetermined spatial deviation shown on said medium,

(e) comparing the deviation of the test pattern image with the reference alignment image for each of said predetermined spatial deviations, by measuring the deviations for a particular deflection distortion at a plurality of predetermined corresponding locations on said images,

(f) adjusting each of the X_{in} and Y_{in} deflection signal functions in each of said circuits so that the correction signal from each circuit is that for which it was determined, and

(g) combining the sum of the signals from each of said plurality of correction circuits and summing the same with the X_{in} and Y_{in} signal to produce total correction signals (X_c,Y_c) to the X and Y deflection means whereby the test pattern image aligns with said reference alignment image.

4,518,899

PROCESS AND APPARATUS FOR CORRELATING STARTUP AND CUTOFF PERIODS OF DIFFERENT INDUCTION MOTORS WITH ONE ANOTHER

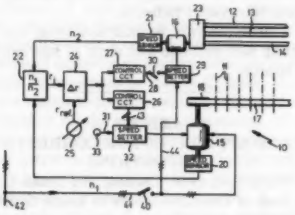
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,408

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309370

Int. Cl.³ H02P 5/46

U.S. Cl. 318—68 **10 Claims**



1. A process for mutually correlating, during a startup period and a cutoff period, the speeds of two asynchronous alternating current induction motors driving different loads in textile machinery whose speed ratio is to remain at least approximately constant in all phases of operation, said motors having different acceleration times to reach their respective operating speeds with full supply voltage on startup and having different deceleration times to reach standstill after deenergization on cutoff,

comprising the steps of:

(a) on startup, modulating the alternating current supply voltage of the motor with the shorter acceleration time to let it reach its operating speed substantially concurrently with the other motor; and

(b) on cutoff, braking the motor with the longer deceleration time to let it reach standstill substantially concurrently with the other motor.

4,518,900

PULSE MOTOR DRIVING APPARATUS

Yoshiaki Nawata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 12, 1983, Ser. No. 513,031

Claims priority, application Japan, Jul. 15, 1982, 57-123651

Int. Cl.³ H02P 1/58

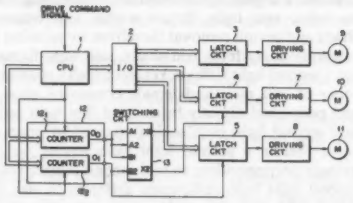
U.S. Cl. 318—102 **3 Claims**

1. A pulse motor driving apparatus for driving a plurality of pulse motors by transferring the operational mode thereof from a slue-up operation wherein the speeds of rotation of said motors are gradually increased to a normal operation wherein said motors are rotated at a constant speed, comprising:

at least first and second timing pulse generating sections for selectively generating slue-up timing pulses having gradually decreasing pulse intervals and normal operation timing pulses having a constant pulse interval, respectively;

a plurality of driving means each connected to an associated one of said plurality of pulse motors for driving the same in synchronization with said slue-up timing pulses and normal operation timing pulses; and

switching means connected between said timing pulse generating sections and said driving means for producing, during the slue-up operation of at least one of said pulse motors, a first switching mode wherein the respective slue-up timing pulses generated by said first timing pulse generating section are supplied to the one of said plurality of driving means associated with said one pulse motor to



independently drive said one motor according to slue-up timing pulses and, during the normal operation of at least two of said pulse motors, for producing a second switching mode wherein the normal operation timing pulses generated by said second timing pulse generating sections are supplied in common to the two driving means associated with said two pulse motors to drive said two pulse motors in common according to the normal operation timing pulses.

4,518,901

MOTOR CONTROL APPARATUS

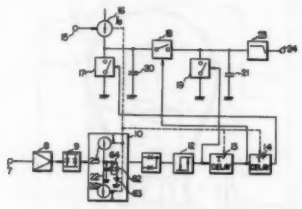
Isao Fukushima; Yasunori Kobori; Hideo Nishijima, and Yoshinori Masuda, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,028

Claims priority, application Japan, Jan. 6, 1982, 57-304

Int. Cl.³ G05B 5/00

U.S. Cl. 318—328 **9 Claims**



1. A motor control apparatus for driving and controlling a motor, in which a signal frequency proportional to a rotation number of said motor is converted into a d.c. voltage by a frequency/voltage converter so as to drive and control said motor by said d.c. voltage, said frequency/voltage converter comprising:

a first, a second, and a third pulse generator for successively producing a first, a second, and a third repetitive pulse, respectively, in response to a signal having said signal frequency proportional to the rotation number of said motor;

a constant current source for supplying output current in accordance with a selected speed of rotation for said motor;

first reset means driven by said third pulse to reset the output current of said constant current source;

a first capacitor connected to said first reset means in parallel

with said first reset means and charged by the output current of said constant current source;

sampling means driven by said second pulse to sample a saw tooth wave signal appearing across said first capacitor;

second reset means driven by said first pulse;

a second capacitor connected to said second reset means in parallel therewith for charging said saw tooth wave signal through said sampling means; and

means responsive to the output current of said constant current source for changing a pulse width of at least one of said first, second and third pulses substantially in accordance with the output current of said constant current source.

4,518,902

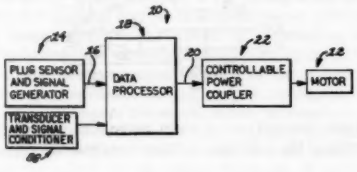
PLUGGING ELECTRICAL BRAKING CONTROL CIRCUIT

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 5, 1983, Ser. No. 455,776

Int. Cl.³ H02P *3/10*

U.S. Cl. 318—373 **11 Claims**



1. In an apparatus (10) for electrically braking a motor (12), said apparatus (10) having means (88) for generating a plurality of different motor power command signals each in response to a respective motor speed command, and controllable supplying means (22) for delivering motor power control signals to said motor (12), the improvement comprising:

means (14) for supplying a plug signal in response to plugging of said motor (12);

means (56) for supplying a current signal in response to the magnitude of current passing through said motor (12); and,

blocking means (102) for receiving said current signal and said plug signal, and limiting said current to a first preselected maximum magnitude in response to the receiving of said plug signal and to a second preselected maximum magnitude in response to the absence of said plug signal, said blocking means (102) including means (98) for controllably modifying said control signals.

8. A motor braking apparatus (10), comprising:

an accelerator pedal (92) being movable to a plurality of motor speed command positions;

means (88) for generating respective digital motor power command signals each in response to a different one of said command positions;

means (14) for supplying a plug signal in response to plugging of said motor (12);

processor means (18) for receiving said plug signal and said command signals, supplying a first preselected motor power control signal in response to the receiving of said command signals in a first preselected range and the receiving of said plug signal, and supplying a plurality of second preselected control signals in response to the receiving of said command signals in the absence of said plug signal; and,

controllable supplying means (22) for receiving said control signals and delivering respective pulse trains to said motor (12) in response to each of said control signals.

4,518,903

DELAYED TURN-OFF CONTROL FOR VEHICLE PUMPING DEVICE

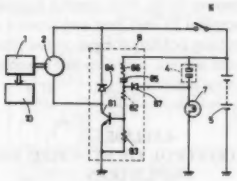
Akio Matsumoto, and Mitsuyoshi Yokota, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 549,181

Claims priority, application Japan, Nov. 12, 1982, 57-171904[U]

Int. Cl.³ B60T *13/72*

U.S. Cl. 318—481 **4 Claims**



1. In a control for a vacuum pump for a vehicle brake, having a power supply, a motor supplied with a voltage from said power supply, said vacuum pump activated by said motor for generating a negative pressure, and a pressure operating unit operable with the pressure from said pump, the improvement comprising:

a brake activated switch means for causing said control to activate said pressure operating unit for a time period coincident with an activated state of said switch means,

said control including circuit means responsive to said switch means for connecting said power supply to said motor,

delay means for causing said control to maintain said pressure operating unit active for a predetermined time period after termination of said activated state of said switch means,

said delay means comprising power supply correcting means responsive to deactivation of said switch means upon termination of said activated state thereof for connecting said power supply to said motor for said predetermined time period subsequent to deactivation of said switch means.

4,518,904

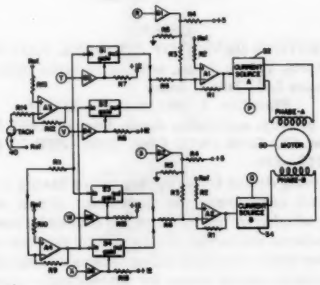
STEPPER MOTOR CONTROL FOR DATA DISK SYSTEM

Nigel MacLeod, Glenrothes, and David Ruxton, Crieff, both of Scotland, assignors to Rodime plc, Glenrothes, Scotland

Filed Jan. 25, 1984, Ser. No. 573,708

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—685 **26 Claims**



1. A stepper motor for use in controlling the operation data

disk storage system, said stepper motor having a rotor and a stator, with the rotor being coupled to an output shaft, and comprising:

first drive means for generating a first phase signal within the stator for creating a first drive force for rotating the rotor;

second drive means for generating a second phase signal within the stator for creating a second drive force for rotating the rotor;

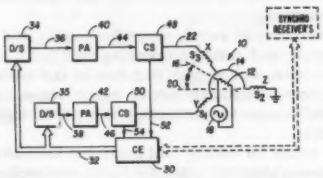
control means for selectively providing positive and negative phase current signals to said first and second drive means for generating 8 stable step positions for the rotor during each motor cycle, said control means controlling the current supplied to said first and second drive means so that the resulting holding torque on the rotor generated by said first and second drive means is substantially the same at each step position.

4,518,905

CURRENT CONTROL OF SYNCHRO POWER AMPLIFIERS

William D. Rhodes, Jr., Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1983, Ser. No. 495,187
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—661 **12 Claims**



1. A synchro system, comprising:

a synchro receiver;

a microprocessor control element coupled to said synchro receiver, said microprocessor control element emulating a synchro transmitter and generating a control signal defining an orientation of said synchro receiver commanded by said microprocessor control element; and

a current sensing circuit coupled between said synchro receiver and said microprocessor control element, said current sensing circuit measuring the magnitude of current developed in said synchro receiver responsive to the control signal set generated by said microprocessor control element, said microprocessor control element being responsive to the measured current to alter the control signal current in the synchro receiver within predetermined maximum and minimum limits.

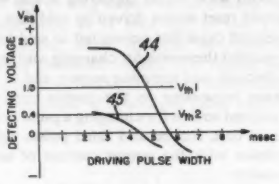
4,518,906

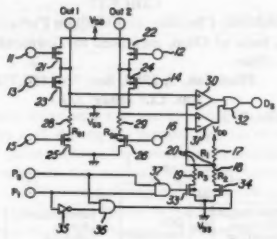
DRIVING DEVICE OF STEPPING MOTOR

Makoto Ueda, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,234
Claims priority, application Japan, Dec. 18, 1980, 55-179504
Int. Cl.³ G04B *19/00*; G04C *3/00*; G05B *19/40*
U.S. Cl. 318—696 **7 Claims**

1. A driving device for a stepping motor having a rotor and driving coil comprising: driver/detector circuit means for detecting whether or not the rotor has rotated by comparing a voltage induced across the driving coil by the free oscillation of the rotor with a reference voltage after a driving pulse is cut off; and control circuit means for automatically changing the pulse width of the driving pulse in response to an output of said driver/detector circuit means, said control circuit means including means for lowering said reference voltage whenever the pulse width of the driving pulse is longer than a predetermined value thereby enabling the pulse width of the driving





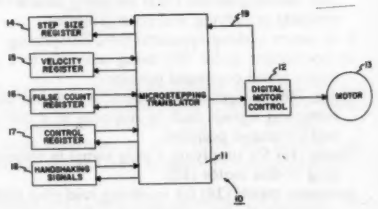
pulse to be changed over a wider range than would otherwise be possible if the reference voltage were maintained constant.

4,518,907

DIGITAL MOTOR CONTROL METHOD AND MEANS

Irving J. Giguere, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Nov. 7, 1983, Ser. No. 549,438
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **6 Claims**



1. A method for continuously controlling a digital motor, comprising:

(a) operating the motor in a microstepping mode over a first range of motor velocities;

(b) operating the motor in a non-microstepping mode over a second range of motor velocities; and

(c) switching from one stepping mode to the other at a predetermined motor velocity.

4,518,908

CONTROL CIRCUIT OF A SYNCHRONOUS MOTOR WITH TWO INDUCTION WINDINGS

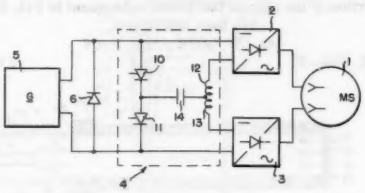
Albert Wiart, Sannois, France, assignor to Jeumont-Schneider Corporation, France

Filed Sep. 13, 1983, Ser. No. 531,772

Claims priority, application France, Oct. 7, 1982, 82 16786

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—723 **4 Claims**



1. Apparatus for controlling the energization of a synchronous motor having two induction windings, comprising an electrical power supply assembly of the mixed bridge or chopper type delivering a current of predetermined polarity and having output terminals connected by a freewheel branch including at least one freewheel diode with its cathode connected to the positive output terminal of the power supply assembly, two oscillators having outputs connected respectively to the windings of the motor, and an intermediary circuit connected between said power supply assembly and said oscillators, said intermediary circuit having, in combination, input terminals connected to the output terminals of said power supply assembly, respectively, two thyristors connected in series across the input terminals, two inductances of equal value mutually coupled with a high mutual induction coupling factor, and a condenser, one side of said condenser being connected to the junction of said thyristors, and means connecting the input terminals of the intermediary circuit to a first pair of input terminals of said oscillators, respectively, that are of opposite polarity and connecting the other side of said condenser to a second pair of input terminals of said oscillators, respectively, that are of opposite polarity, with said inductances connected in series, respectively, with the terminals of one of said pairs.

4,518,909

SET VALUE TRANSMITTER FOR A DRIVE REGULATION APPARATUS

Paul Friedli, Zurich; Thomas Hinderling, Ebikon, and Guntram Begle, Adligenswil, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Nov. 14, 1983, Ser. No. 551,319

Claims priority, application Switzerland, Nov. 19, 1982, 6740/82

Int. Cl.³ G05B *13/02*

U.S. Cl. 318—566 **3 Claims**

1. A reference value transmitter for a drive control system, comprising:

a control store in which there are stored at least permissible jerk values and threshold values of acceleration;

a reference value clock pulse generator to which said control store is connected and operating at a predetermined clock pulse frequency;

said reference value clock pulse generator having an input;

three integrators for the respective formation of acceleration, velocity and displacement path;

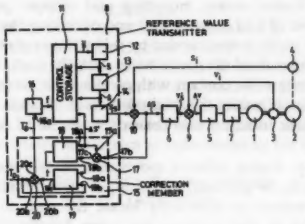
said three integrators being connected in circuit with said control store;

a displacement path regulation circuit to which an output of the integrator for the displacement path is supplied, said output constituting a displacement path-reference value upon appearance of clock pulse signals from said reference value clock pulse generator;

a correction member having a first input, a second input and an output;

said correction member being connected by said first input with said control store and by said second input with said displacement path regulation circuit;

said correction member being connected at said output to said input of said reference value clock pulse generator;



said displacement path regulation circuit supplying a displacement path-regulation deviation to the second input of said correction member;

said control store supplying a threshold value of said displacement path-regulation deviation to the first input of said correction member; and

said correction member altering the clock pulse frequency of said reference value clock pulse generator when said threshold value is exceeded and proportional to an excess defined by the amount that the displacement path-regulation deviation exceeds the threshold value.

4,518,910

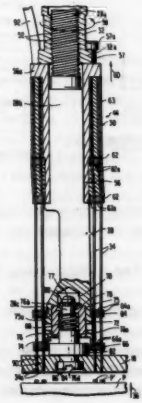
BUCKLING BEAM TWIST PROBE CONTACTOR ASSEMBLY WITH SPRING BIASED STRIPPER PLATE

Hans G. Hottenrott, Wappingers Falls, N.Y.; Philo B. Hodge, Roxbury, Conn., and Thomas J. Cochran, La Grangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,519

Int. Cl.³ G01R *31/02, 1/06*

U.S. Cl. 324—158 P **8 Claims**



1. In a buckling beam test probe assembly comprising an array of current carrying electrically conductive beams

mounted so as to buckle when biased into contact with the product to be tested, the improvement wherein said array of buckling beams comprises continuous wires to the test apparatus interface, and said assembly comprises:

at least one support post movable, relatively, towards and away from the product,

a slide mounted on said support post,

means for fixing said wires intermediate of their ends to said slide,

a stripper plate,

spring loaded means mounting said stripper plate to the bottom of said support post and overlying the product,

slidable guide means carried by said stripper plate for aligning the ends of the probe wires with the underlying product for precise contact with product test points, and

means for adjusting the axial position of the slide relative on said post to adjust said beams lengthwise of said stripper plate;

whereby, during relative movement of said support post towards the product, said stripper plate initially contacts the product to accurately locate the ends of the wires relative to the product, the wires function as uninterrupted conductors to reduce electric opens and shorts within the test equipment, said stripper plate protects the probe tips from damage, and wherein the beams deflect intermediate of said slide and said stripper plate to insure low ohmage engagement with the product.

4,518,911

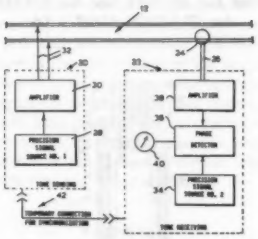
CABLE TEST APPARATUS

James L. Cass, Northridge, Calif., assignor to Perkins Research & Mfg. Co., Inc., Canoga Park, Calif.

Filed Jan. 19, 1983, Ser. No. 459,134

Int. Cl.³ G01R *31/08*

U.S. Cl. 324—52 **9 Claims**



5. Apparatus for testing two-wire conductive pairs exhibiting fixed resistance and capacitance per unit length, comprising:

(a) means for applying a continuous, fixed a.c. signal to a conductive pair;

(b) means for sensing the current flow in the pair from the signal;

(c) means for determining the phase angle between the applied a.c. signal and the sensed current resulting from the resistive and capacitive components of the current flow; and

(d) means for comparing the phase angle of the applied signal to the phase angle of the sensed current flow in the signal source.

4,518,912

RADIATION DETECTOR

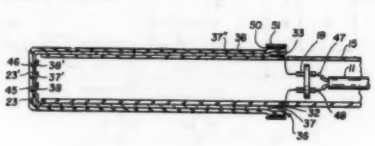
Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.

Continuation of Ser. No. 678,901, Apr. 21, 1976, abandoned, which is a continuation of Ser. No. 423,754, Dec. 11, 1973, abandoned, which is a division of Ser. No. 200,536, Nov. 19, 1971, Pat. No. 3,794,914, and a continuation-in-part of Ser. No. 848,620, Aug. 8, 1969, Pat. No. 3,641,439. This application Apr. 5, 1978, Ser. No. 893,588

The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.

Int. Cl.³ G01R *5/26, 21/04*

U.S. Cl. 324—95 **3 Claims**



1. A radiation detector comprising a sensor assembly mounted at one end of an elongated handle, said sensor assembly including first metallic films for converting free space electromagnetic radiation into direct current voltage, said films including overlapping films forming hot and cold thermocouple junctions, said overlapping films including thin films of dissimilar metals, said thin films being resistive and converting alternating currents induced by said radiation into thermal energy, the hot and cold junctions of said films having electrical and thermal conductivities selected to cause said alternating currents to heat said hot junction to a higher temperature than said cold junction and produce said direct current voltage, said handle including conductive members aligned with the direction of elongation and electrically connected to said thermocouples thereby to provide said direct current voltage to a voltage measuring apparatus.

4,518,913

MEASURING PROBES

Rodney P. Jackson, Southport, England, assignor to H.E.M.E. International Limited, St. Helens, England

Filed May 18, 1982, Ser. No. 379,344

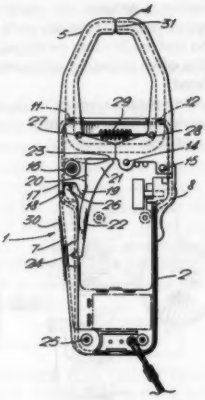
Claims priority, application United Kingdom, May 22, 1981, 8115877

Int. Cl.³ G01R *1/22, 33/00;* H01F *17/06*

U.S. Cl. 324—127 **10 Claims**

1. A measuring probe of the kind in which a substantially complete ring or magnetisable material is formed around a conductor, said probe comprising: a set of opposed jaws of magetisable material mounted to be relatively movable between an open position in which the ring is broken and the jaws can be placed over a conductor, and a closed position in which the jaws meet around the conductor and the ring of magnetisable material is at least substantially complete; an opening mechanism for said jaws with an actuator; means coupling said mechanism to at least one of said jaws to actuate said jaws to said open position, said mechanism including leverage means constructed such that initial pressure on said actuator urges said jaws apart from said closed position at a first mechanical advantage and, after initial movement of said

actuator, subsequent pressure on said actuator urges said jaws toward said open position at a second lower mechanical advantage, the ratio of said first mechanical advantage to said second mechanical advantage being at least 3:1.

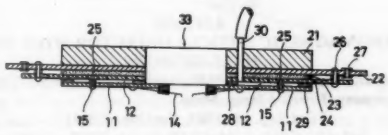


4,518,914

TESTING APPARATUS OF SEMICONDUCTOR WAFERS

Masao Okubo, Tokyo; Yasuro Yoshimitsu, Takatsuki; Fumio Nakai, Amagasaki, all of Japan, and Oliver R. Garretson, Cupertino, Calif., assignors to Japan Electronic Materials Corportion, Amagasaki, Japan

Filed Aug. 2, 1982, Ser. No. 404,055
Claims priority, application Japan, Aug. 3, 1981, 56-122135
Int. Cl.³ G01R *1/06, 31/02*
U.S. Cl. 324—158 F **5 Claims**



1. A testing apparatus for testing semiconductor wafers, said apparatus comprising.

a base plate of rigid material and having an opening at the center thereof, and a plurality of electrically conductive lead-out terminals on said base plate;

a sheet of resilient material against said base plate and having an opening concentric with said opening in said base plate, and electrically conductive connecting pins connecting said resilient material sheet to said plate and being electrically connected to corresponding ones of said lead-out terminals;

at least two sealing sheets of resilient material on the surface of said resilient material sheet facing away from said base plate and spaced from each other along the surface of said resilient material sheet for defining a space therebetween;

electrically conductive terminal contacts in said resilient material sheet having end portions protruding into said space and said contacts being electrically connected to said connecting pins;

vacuum means extending through said base plate and said resilient material sheet and communicating with said space for producing a vacuum in said space; and

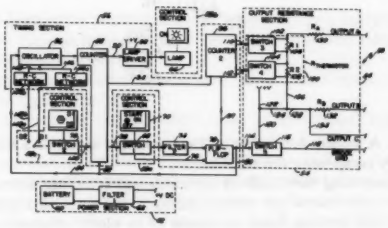
a probe card against said two sealing sheets and held there against by the vacuum in said space and having an opening concentric with said opening in said base plate, and a plurality of probe needles thereon extending generally radially into said probe card opening in an arrangement for contacting test terminal of a semi-conductor wafer to be tested, each of said probe needles having a terminal contact with a portion protruding into said space, said terminal contacts being located to contact said terminal contacts on said resilient material sheet for effecting electrical connection therewith when said probe card is against said sealing sheets.

4,518,915

TEST DEVICE FOR EXPENDABLE BATHYTHERMOGRAPH SET (XBT)

Philip G. Danforth, Old Mystic; Thomas G. Bucko, Colchester; Kenneth R. Galliher, Mystic, all of Conn.; Joseph T. Lucia, West Springfield, Mass.; Richard L. Miller, Niantic, and Timothy B. Straw, New London, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,103
Int. Cl.³ G01K *15/00*
U.S. Cl. 324—158 R **5 Claims**



1. A device for testing an XBT system, comprising:

a D.C. power source;

a first control means, connected to said D.C. power source, for applying said D.C. power to said test device in such a way as to initiate a test cycle, said first control means further comprising a three position switch, the START position of which is capable of providing a momentary pulse;

timing means, attached to said first control means, for receiving said momentary pulse from said first control means and producing a preselected number of pulses over a preset time interval for controlling said test cycle, said timing means further comprising, a flip-flop, connected to said first control means, for receiving said momentary pulse and setting in such a way as to produce an appropriate output signal, said flip-flop remaining in said test state after said switch returns to its normal ON position, an oscillator, connected to said flip-flop, for receiving said flip-flop output signal and producing an output stream of pulses therefrom, a first counter, connected to said oscillator and to said three position switch for receiving said output pulse stream from said oscillator to count the number thereof, and the output of said flip-flop, a second counter, connected to said first counter and said flip-flop, for receiving the outputs therefrom and dividing the output pulse stream from said first counter into six equal intervals, and a plurality of R-C networks, connected to said second control means and to said oscillator, for controlling the output pulse rate of said oscillator;

a second control means, attached to said timing means, for providing a preselected test cycle time duration;

a third control means, attached to said timing means, for indicating test device power-on and test-in-progress; and

thermistor simulating means, attached to said timing means, for receiving sequenced timing signals from said timing

means and switching a preset sequence of resistance values across the output of said thermistor simulating means in such a way as to simulate a plurality of temperature-proportional resistance measurements produced by an actual XBT probe.

4,518,916

SYSTEM FOR DETECTING ROTATIONAL SPEED

Shigeki Kawada, Hino, and Hiroshi Ishida, Tokyo, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

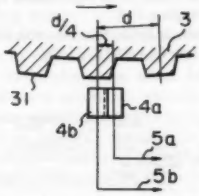
PCT No. PCT/JP81/00313, § 371 Date Jun. 23, 1982, § 102(e) Date Jun. 23, 1982, PCT Pub. No. WO82/01594, PCT Pub. Date May 13, 1982

PCT Filed Oct. 29, 1981, Ser. No. 395,020

Claims priority, application Japan, Oct. 30, 1980, 55-151453

Int. Cl.³ G01P *3/48, 3/54*

U.S. Cl. 324—173 **1 Claim**



1. A system for detecting the rotational speed of a rotating body comprising the steps of:

generating two kinds of signals A and B having alternating wave forms and corresponding to the rotational speed of said rotating body by means of an electromagnetic position-detecting device including a rotary disc having circumferential projections and fixed electromagnetic position detector elements, said signals A and B having the same amplitude and the phases of said signals A and B always differing by 90°,

producing switching signals S(A), S($\overline{A}$), S(B), and S($\overline{B}$) from said signals A and B by means of zero-cross circuits and also producing inverted signals $\overline{A}$ and $\overline{B}$ from said signals A and B by means of inverter circuits,

producing differentiation signals dA, $\overline{dA}$, dB, and $\overline{dB}$ from differentiation circuits consisting of resistors and capacitors to which the produced signals A, $\overline{A}$, B, and $\overline{B}$ are suppllied and

obtaining output signals corresponding to the rotational speed of said rotating body by selectively switching the differentiation signals dA, $\overline{dA}$, dB, and $\overline{dB}$ in switching circuits in accordance with switching signals S(A), S($\overline{A}$), S(B), and S($\overline{B}$) applied to the switching circuits, whereby the rotational speed of said rotational body is detected as a direct current voltage signal having an amplitude proportional to the rotational speed of the rotating body and having a small ripple ratio.

4,518,917

PLURAL SENSOR APPARATUS FOR MONITORING TURBINE BLADING WITH UNDESIRED COMPONENT ELIMINATION

Robert M. Oates, Murrysville; Carlo F. Petronio, Ross Township, Allegheny County, and Mark G. Kraus, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,638

Int. Cl.³ G01H *11/00;* **G01B** *7/14;* **G01M** *1/22;* **G01N** *27/72*

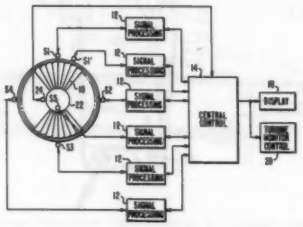
U.S. Cl. 324—207 **17 Claims**

1. Turbine blading monitoring apparatus comprising:

(A) a plurality of sensors of the type having a certain impedance which changes in response to the sensor's proximity to a conducting member;

(B) said sensors being positioned adjacent said blading at respective positions around the periphery thereof for providing respective output signals each having a component related to turbine blading proximity, and being subject to inclusion of an indesired component which is non-proximity related;

(C) signal processing means responsive to said sensor output signals for generating detected sensor signals having alternate positive and negative peaks;



(D) control means including computer means for deriving proximity indications in response to said detected sensor signals;

(E) peak detector means operable to receive said detected sensor signals to provide a peak signal indicative of the envelope of said detected sensor signals applied to it;

(F) said signal processing means including circuit means for generating respective balancing signals and combining them with respective ones of said output signals due to said turbine blading to minimize the effects of said undesired component therein whenever said peak signal exceeds predetermined positive and negative threshold values.

4,518,918

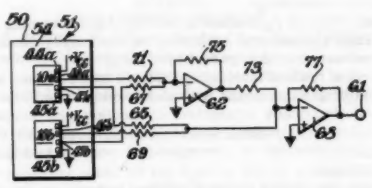
FERROMAGNETIC ARTICLE DETECTOR WITH DUAL HALL-SENSORS

Grant D. Avery, Loudon, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 28, 1982, Ser. No. 425,213

Int. Cl.³ G01B *7/14;* **G01R** *33/06;* **H01L** *43/06*

U.S. Cl. 324—208 **10 Claims**



1. A ferromagnetic article detector comprising:

(a) a pair of essentially identical silicon-integrated-circuit-Hall-sensor chips each of the type capable of providing between a first and a second output thereof a differential output voltage that is a continuous function of the strength of a magnetic field perpendicular to a major face of the integrated circuit chip, each of said chips comprising a Hall element being co-planar with said major face of said each chip and a differential amplifier having an input connected to the output of said Hall element; and having an output connected to said first and second outputs

(b) a permanent magnet in the shape of a bar having at least one substantially flat end and being magnetized in a direction perpendicular to said end, said pair of integrated circuit chips being mounted spaced apart at said magnet end with their major surfaces lying in a plane that is parallel to said bar end;

(c) a differential comparator means having one and another inputs; and

(d) a voltage summing means coupling to said one comparator means input a sum of the output voltages at the first differential output of one of said Hall-sensor chips and the second differential output of the other of said Hall sensor chips, and coupling to said another comparator means input a sum of the output voltages at the second differential output of said one chip and at the first differential output of said other chip, said differential comparator means being for producing a detector-output-signal that is proportioned to the difference between the output signals of said two amplifiers.

4,518,919

DETECTING DEVICE FOR DETECTING A MAGNETIC STRIP EMBEDDED IN A SHEET

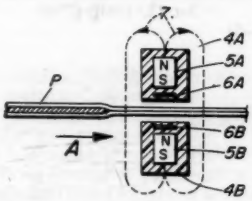
Tsuyoshi Ishida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 4, 1982, Ser. No. 336,684

Claims priority, application Japan, Jan. 16, 1981, 56-3893; Jun. 3, 1981, 56-84314; Jun. 29, 1981, 56-99619

Int. Cl.³ G01R *33/12*; G01N *27/72*; G07D *7/00*; G06K *7/08*

U.S. Cl. 324—228 **3 Claims**



1. A detecting device for detecting a sheet of genuine paper money having a longer dimension and a shorter dimension, the sheet including an embedded magnetic strip having a length substantially equal to the shorter dimension of the sheet and a predetermined width, the strip being oriented within the sheet so that its length is substantially parallel to the shorter dimension of the sheet, said detecting device comprising:

transporting means for rapidly transporting the sheet in the direction of its longer dimension along a transportation path;

first and second magnetic sensors having long and narrow shaped planes positioned on directly opposite sides of said path along a line substantially perpendicular to said transportation path, each sensor including:

magnetic field generating means for generating a magnetic field which intersects said transportation path and passes through the generating means of said other magnetic sensor, the intersection of the magnetic field and the transportation path being long and narrow and having a longitudinal axis oriented substantially coincident with said magnetic strip at the moment when said magnetic strip passes between said first and second sensors; and

variable magnetic resistance means adjacent said generating means having a resistance which is dependent on the magnetic field received from said generating means; and

means for detecting the resistance variation of said variable magnetic resistance means when said magnetic strip passes between said first and second sensors.

4,518,920

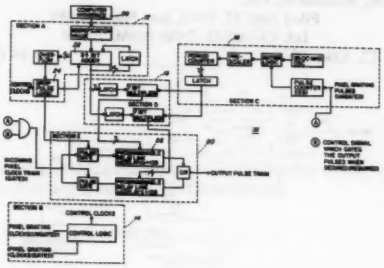
FREQUENCY SYNTHESIZER AND METHOD

Andrew Warner, Harvard, Mass., and David A. Zlotek, Nashua, N.H., assignors to Klimsch/Optronics, Inc., Chelmsford, Mass.

Filed Jun. 3, 1982, Ser. No. 384,611

Int. Cl.³ H03L *7/16*

U.S. Cl. 328—14 **7 Claims**



1. A method for synthesizing a variable frequency that is less than the variable frequency of an input pulse train, said method comprising the steps of:

(1) selecting a percent reduction of the variable frequency of the input pulse train;

(2) determining the reciprocal value of the percent reduction;

(3) generating a variable output pulse train; and,

(4) varying the spacing of the variable output pulse train pulses so that their spacing relative to the variable input pulse train pulse is equal to the fractional value of repeated additions when the reciprocal value of the percent reduction is added to the accumulated value of all additions.

4,518,921

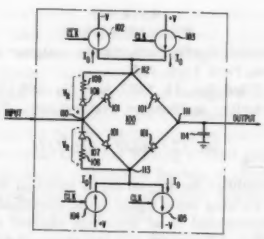
TRACK AND HOLD CIRCUIT

Shawn M. Logan, Andover, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 18, 1982, Ser. No. 435,057

Int. Cl.³ H03K *17/74*; G11C *27/02*

U.S. Cl. 328—151 **14 Claims**



1. A track and hold circuit comprising

first storing means,

switch means for coupling a time varying input signal from an input node to said first storing means in response to at least one track control signal and isolating said input node from said first storing means in response to at least one hold control signal, and

means for respectively supplying said track and hold control signals to said switch means during successive tracking and holding time intervals, said track signal varying with said input signal over the tracking interval and said hold

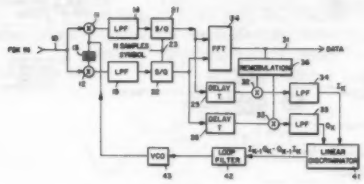
control signal varying with said input signal over the holding interval.

4,518,922

DECISION-DIRECTED, AUTOMATIC FREQUENCY CONTROL TECHNIQUE FOR NON-COHERENTLY DEMODULATED M-ARY FREQUENCY SHIFT KEYING

James R. Luecke, Franklin, Mass., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 17, 1983, Ser. No. 458,459
Int. Cl.³ H03L 7/08; H04L 27/14
U.S. Cl. 329—50 14 Claims



1. For use in a demodulator for detecting information symbols which are encoded in the form of a frequency shift keying carrier signal, said demodulator containing means for generating a local carrier signal, an arrangement for controlling said local carrier signal for tracking frequency changes therein comprising:

first means for combining said local carrier signal and an incoming frequency shift keying signal to be demodulated and producing therefrom signals representative of the modulation information contained in said incoming signals;

second means, coupled to said first means, for deriving output signals representative of the information symbols by which said carrier signal was modulated to form said frequency shift keying signals;

third means, responsive to signals produced by said first and second means, for deriving error signals representative of the frequency error in said local carrier signal; and

linear discriminator means, responsive to said error signals, for controlling said local carrier signal generating means so as to track frequency changes in said incoming frequency shift keying signal to be demodulated.

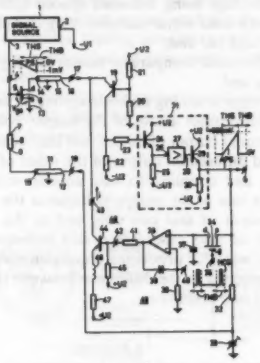
4,518,923

PREAMPLIFIER

Pieter B. Dielhof, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,122
Claims priority, application Netherlands, Feb. 19, 1982, 8200670
Int. Cl.³ H03F 1/02, 1/34
U.S. Cl. 330—9 6 Claims

1. A preamplifier having an input terminal for receiving a periodically varying input signal to be amplified, which input terminal is connected to at least one control electrode of a voltage controlled transistor and to a terminal of a resistor, the transistor and the resistor forming part of a first stage of the preamplifier, an output electrode of this transistor being coupled to an input terminal of a second stage of the preamplifier via a direct current connection, an output terminal of the second stage being coupled to a further terminal of the resistor via a direct current connection, which preamplifier has an output terminal for supplying the amplified input signal, the preamplifier comprising a fedback signal clamping circuit, which is fedback from the output terminal of the preamplifier, for periodically clamping a signal level in the amplified signal at this output terminal at a first reference voltage, characterized in that the fedback signal clamping circuit is present between said output terminal of the preamplifier and said input terminal of the second stage of the preamplifier and said output



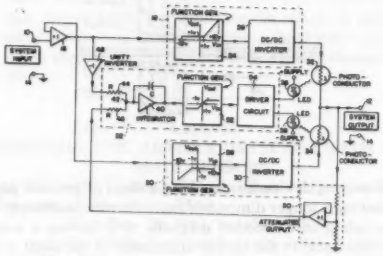
terminal of the preamplifier has a direct current connection to said output terminal of the second stage of the preamplifier.

4,518,924

HIGH VOLTAGE AMPLIFIER

Robert E. Vosteen, 1027 Archbald Rd., Waterport, N.Y. 14571

Filed Dec. 21, 1982, Ser. No. 451,815
Int. Cl.³ H03F 17/00
U.S. Cl. 330—51 20 Claims



1. A high voltage amplifier system capable of developing a high voltage output signal at an output terminal in response to a low voltage input signal presented to an input terminal, the system comprising:

means coupled to the input terminal for producing a high voltage signal of a first polarity in response to the input signal, said first polarity high voltage signal being directly proportional to the input signal when the input signal exceeds a first predetermined level and being constant when the input signal is below said first predetermined level;

means coupled to the input terminal for producing a high voltage signal of a second polarity in response to the input signal, said second polarity high voltage signal being directly proportional to the input signal when the input signal falls below a second predetermined level and being constant when the input signal is above said second predetermined level;

first conductive means connected between said first polarity high voltage signal producing means and the output terminal;

second conductive means connected between said second

polarity high voltage signal producing means and the output terminal; and

means for selectively adjusting the conductivity of said first and second conductive means in response to the input signal such that said first conductive means is heavily conducting when the input signal exceeds said first predetermined level and said second conductive means is heavily conducting when the input signal falls below said second predetermined level.

4,518,925

SIGNAL PROCESSING CIRCUITS

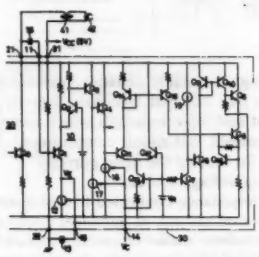
Hideki Fukasawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,896

Claims priority, application Japan, Dec. 30, 1982, 57-198542

Int. Cl.³ H03F *3/04*; G11B *5/02*

U.S. Cl. 330—51 **8 Claims**



1. A signal processing circuit for supplying with an amplified output signal, comprising;

amplifying circuit means having an input terminal connected to a signal source, an output terminal for delivering the amplified output signal threrfrom, and a control terminal,

capacitive means coupled to the control terminal of said amplifying circuit means for serving as a bypass capacitor for said amplifying circuit means,

charging circuit means connected to the control terminal of said amplifying circuit means for forming a path for a charging current to said capacitive means,

discharging circuit means connected to the control terminal of said amplifying circuit means for forming a path for a discharging current from said capacitive means, and

controlling circuit means having a control signal input terminal supplied with a control signal taking at least first and second states, and being operative to control said charging circuit means to allow the charging current to flow to said capacitive means so as to produce thereat a potential for making said amplifying circuit means inoperative when said control signal is turned to take the first state and control said discharging circuit means to allow the discharging current to flow from said capacitive means to as to produce thereat a potential for making said amplifying circuit means operative when the control signal is turned to take the second state.

4,518,926

GATE-COUPLED FIELD-EFFECT TRANSISTOR PAIR AMPLIFIER

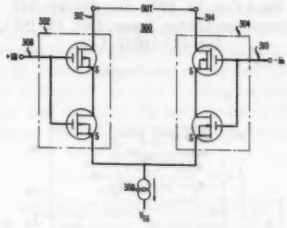
Eric J. Swanson, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1982, Ser. No. 451,025

Int. Cl.³ H03F *3/16, 3/45*

U.S. Cl. 330—253 **6 Claims**

1. The combination of a first enhancement mode and a first depletion mode field effect transistor with their gates connected together and providing a linear input node, their drain-to-source conduction paths being connected in series and provided with a substantially constant bias current supply means for establishing a bias current therethrough.



4,518,927

SIGNAL PROCESSING SYSTEM COMPRISING A SIGNAL SOURCE, A SIGNAL PROCESSING UNIT AND CONNECTING CABLES

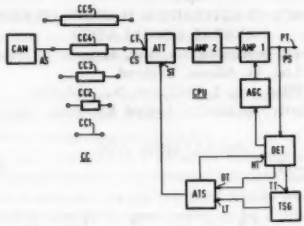
Rudolf P. Koppe, and Hendrik Blom, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,201

Claims priority, application Netherlands, Jun. 24, 1982, 8202571

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—284 **5 Claims**



1. A signal processing system which provides a substantially constant amplitude signal transmitted over a connecting cable selected from a plurality of connecting cables of different lengths of different losses, comprising:

a series signal processing circuit which receives a signal from said selected cable which includes:

a signal amplifier having automatic gain control,

a low noise signal amplifier having a fixed gain,

a switchable signal attenuator having a changeover input which selects and locks a different attenuation level in response to an applied signal

a timing signal generator for generating a delay signal in response to an input signal;

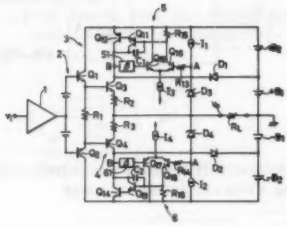
a signal detector connected to receive an output signal from said series circuit, and to supply an input signal to said timing signal generator; and

a changeover circuit connected to receive a signal from said signal detector and said timing signal generator, said changeover circuit connected to said switchable signal attenuator changeover input, said series signal processing circuit providing a controlled amplitude signal when a selected attenuation level is locked by said delay signal after a time delay generated by said timing signal generator.

4,518,928
POWER SUPPLY CIRCUIT FOR AMPLIFIER

Satoshi Ishii, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 449,935
Claims priority, application Japan, Dec. 15, 1981, 56-202011
Int. Cl.³ H03F 3/30
U.S. Cl. 330—297 7 Claims

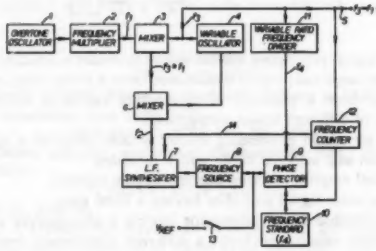


1. A power supply circuit for an amplifier, comprising; means for generating a voltage corresponding to the amplifying output signal level of said amplifier and for supplying said voltage to the power supply terminal of said amplifier, said supply means comprising a phase compensated amplifying means having a signal corresponding to said amplifying output signal level as an input, the output of said amplifying means being supplied to said power supply terminal, said amplifying means increasing the amplification degree rather than decreasing said degree in the high frequency region.

4,518,929
FREQUENCY SYNTHESIZER HAVING OVERTONE CRYSTAL OSCILLATOR

David P. Owen, Dunstable, England, assignor to Marconi Instruments, Ltd., St. Albans, England

Filed Aug. 2, 1982, Ser. No. 404,474
Claims priority, application United Kingdom, Aug. 4, 1981, 8123809
Int. Cl.³ H03L 7/00
U.S. Cl. 331—11 8 Claims

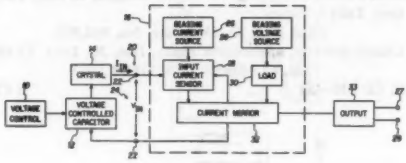


1. A frequency synthesizer including an overtone; crystal oscillator arranged to produce a first frequency; a variable frequency source arranged to produce a second frequency which is lower than said first frequency; means for combining the first and second frequencies to produce a required output signal at a third frequency; and means for adjusting the value of said second frequency to compensate for departures of the first frequency from a nominal value causing variations in said third frequency, wherein said combining means comprises an output oscillator for generating said third frequency and means for mixing said first frequency with said third frequency to generate a frequency which is nominally equal to said second frequency, any difference between said second frequency and said frequency which is nominally equal to said second frequency being used to adjust the frequency of oscillation of said output oscillator.

4,518,930
NEGATIVE RESISTANCE CIRCUIT FOR VCO

John G. Rozema, Wheaton, and William I. H. Chen, Naperville, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 30, 1982, Ser. No. 403,896
Int. Cl.³ H03B 5/36, 7/06; H03H 11/52; H03L 7/00
U.S. Cl. 331—36 C 10 Claims



1. A high-frequency negative resistance circuit having at least one pair of input terminals, thereby defining an input current at said input terminals which causes a voltage at said input terminals, said circuit comprising:

means for sensing the input current;

a biasing voltage source;

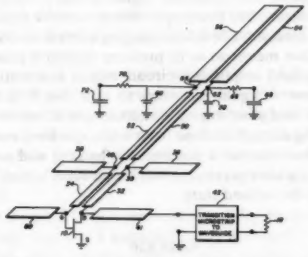
a load impedance connected to said biasing voltage source; and

current mirror means connected to said means for sensing and to said load impedance for producing a current in said load impedance approximately equal to said input current and for controlling said means for sensing to cause the voltage at the input terminal to decrease as the input current increases and to increase as the input current decreases, when the input current is less than a knee current.

4,518,931
TRANSISTOR OSCILLATOR/FREQUENCY DOUBLER WITH OPTIMIZED HARMONIC FEEDBACK

Christen Rauscher, 3101 Crafford Dr., Ft. Washington, Md. 20744

Filed May 5, 1983, Ser. No. 491,841
Int. Cl.³ H03B 5/18, 1/04
U.S. Cl. 331—76 26 Claims



1. An oscillator circuit for generating power at a desired harmonic frequency comprising:

a transistor with a B, a C, and an E terminals which form ports C-E and B-E;

a coupling network connected to said B, C, and E terminals and including a first circuit for providing feedback at a fundamental frequency f_o from said C-E port to said B-E

port in order to make said transistor oscillate at said frequency f_o, and a second circuit connected to and operating in conjunction with said first circuit for providing isolation between ports C-E and B-E at the desired harmonic frequency of f_o to thereby prevent coupling at the harmonic frequency;

a bias circuit for supplying appropriate voltages to said transistor terminals to effect biasing thereof; and

means for coupling the desired harmonic from said port C-E to a load.

4,518,932

COAXIAL MAGNETRON HAVING CAVITY WALLS VIBRATED BY TUNING FORK

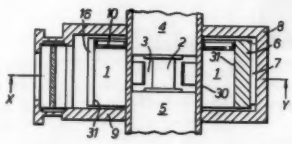
Alan H. Pickering, Springfield, United Kingdom, assignor to English Electric Valve Company, Ltd., Chelmsford, England

Filed Aug. 10, 1982, Ser. No. 407,274

Claims priority, application United Kingdom, Sep. 8, 1981, 8127125

Int. Cl.³ H03B *9/10*; H01J *25/55*

U.S. Cl. 331—90 **21 Claims**



1. A co-axial magnetron including an annular resonant cavity which is delimited by an outer cylindrical wall within the magnetron, which surrounds a cathode and which determines the frequency of oscillation of a microwave signal generated by the magnetron; tuning fork means operative to induce vibratory motion in the outer cylindrical wall of said annular resonant cavity so as to cyclically alter its resonant frequency; and means responsive to the movement of the outer cylindrical wall for generating a signal representative of the instantaneous resonant frequency of the cavity.

4,518,933

INTEGRABLE TRANSISTOR OSCILLATOR REQUIRING ONLY ONE PIN TO QUARTZ RESONATOR

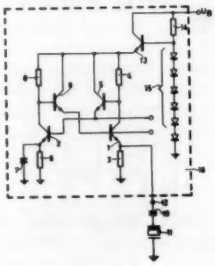
Klaus Kröner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1982, Ser. No. 345,995

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104849

Int. Cl.³ H03B *5/30*; H03K *3/281*

U.S. Cl. 331—108 D **4 Claims**



1. A quartz oscillator comprising first and second transistors whose collectors are connected via respective serial collector impedances to a pole of a direct voltage source and are coupled via respective semiconductor junctions to the base of the other transistor, a two-pole network comprising a quartz resonator being connected to the emitter of the first transistor; said quartz oscillator being characterized in that the emitters of the first and second transistors are each connected to the other pole of the direct voltage source via respective emitter impedances which are conductive to direct current, the product of the emitter impedances being greater than the product of the collector impedances, that the two-pole network is arranged in parallel with the emitter impedance of the first transistor and that a supply voltage of the direct voltage source has been chosen so low that the collector-base diodes of the first and second transistors are always in the non-conducting state.

4,518,934

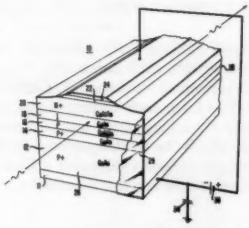
OPTICAL BISTABLE DEVICE

Thirumalai N. C. Venkatesan, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 16, 1982, Ser. No. 348,869

Int. Cl.³ H01S *3/10*; G02F *1/28*

U.S. Cl. 332—7.51 **5 Claims**



1. An optical bistable device of the type comprising:

means defining a Fabry-Perot interferometer cavity with an input face parallel to and spaced from an output face:

an optical absorbing medium within said cavity;

and

means including a pair of electrodes for generating an electric field within said medium;

said device being characterized by:

at least two contiguous regions of different conductivity type in said medium and oriented between said electrodes so that a reverse-bias electric field results when a driving voltage is applied to said electrodes by a driving voltage source; and

resistance means connected in series between one of said electrodes and said driving voltage source for generating a back-voltage in response to photo-generated current flow between said electrodes,

whereby photo-generated current which is generated between said electrodes results in a reduction of the electric field within said medium to provide negative feedback response to a light signal incident on said medium.

4,518,935

BAND-REJECTION FILTER OF THE SWITCHED CAPACITOR TYPE

Arthur H. M. van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,497

Claims priority, application Netherlands, Jul. 12, 1983, 8302482

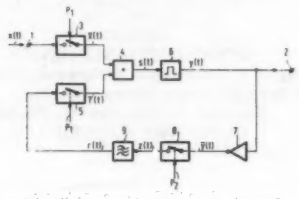
Int. Cl.³ H03H *19/00*

U.S. Cl. 333—173 **1 Claim**

1. A band-rejection filter of the switched capacitor type for suppressing at least one unwanted frequency component present in an analogue information signal, comprising:

(a) a filter input for receiving the analogue information signal and a filter output;

(b) combining means whose output is coupled to the filter output;
(c) first switching means for applying the information signal and a feedback signal to the combining means and which are controlled by a first control signal;
(d) a bandpass filter of the switched capacitor type the passband of which comprises at least the unwanted frequency component and which produces the said feedback signal;
(e) second switching means for coupling the input of the bandpass filter to the filter output and which are controlled by a second control signal;



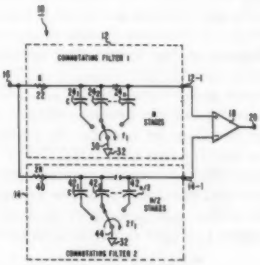
(f) a control signal generator for producing the first and second control signals, each consisting of a sequence of control signal periods of a duration T_s and occurring at a frequency f_s ($T_s = 1/f_s$), each control signal period being partitioned into a tracking phase and an interrupt phase, the instants at which the tracking phases in the first and second control signals end evidencing a fixed phase shift which is unequal to zero and less than half a control signal period.

4,518,936

COMMUTATING FILTER PASSING ONLY THE FUNDAMENTAL FREQUENCY AND ODD HARMONICS THEREOF

Eldon M. Sutphin, Jr., Hillsboro Township, Hancock County, N.H., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 14, 1983, Ser. No. 551,587
Int. Cl.³ H03H *19/00, 11/04*
U.S. Cl. 333—173 **5 Claims**



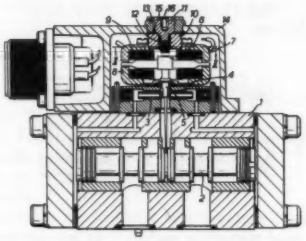
1. A commutating filter comprising in combination:
a filter input terminal;
a filter output terminal;
a first commutating filter coupled to receive a signal of frequency f_1 from said filter input terminal and comprising N storage stages, each having a time constant RC, said first commutating filter having an output terminal at which is presented a first filter output signal;
a second commutating filter coupled to receive said frequency f_1 from said filter input terminal and comprising N÷2 storage stages each having a time constant 2 RC, said second commutating filter having an output terminal at which is presented a second filter output signal;
first means coupled to said first and second filters to sample said first filter storage stages at f_1 and to sample said second filter storage stages at $2f_1$; and
second means coupled between said output terminals from said first and second commutating filters and said filter output terminal for subtractively combining the filter output signals at said filter output terminal.

4,518,937

ELECTRO-HYDRAULIC SERVO VALVES AND ELECTRICAL FORCE MOTORS SUITABLE THEREFOR

Dennis W. Parker, Cheltenham, United Kingdom, assignor to Dowty Hydraulic Units Limited, England

Filed Mar. 7, 1983, Ser. No. 473,279
Claims priority, application United Kingdom, Mar. 19, 1982, 8208146
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—229 **4 Claims**



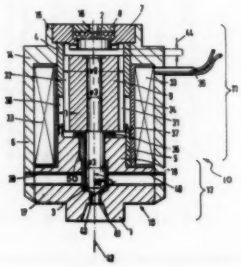
1. An electrical force motor having first and second pole pieces, an armature having a portion thereof disposed between poles of the first and second pole pieces for movement relative thereto and a circular permanent magnet, polarized across a diameter thereof, disposed at least partly within and between poles of one of the pole pieces and rotatably adjustable with respect to that pole piece magnetically to adjust the position of the armature relative to the pole pieces.

4,518,938

SOLENOID HAVING LOW-FRICTION COATING INTERNALLY OF THE ARMATURE SLEEVE

Reiner Bartholomäus, Neuendorf, and Christoph Gibas, Neunkirchen, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,164
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309904
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—262 **19 Claims**



1. A solenoid comprising:
a housing having two ends;

winding means adapted for being energized by flow of electricity;

winding support means, arranged within said housing, for supporting said winding means;

an armature mounted for reciprocal movement within said winding support means in response to energization of said winding means;

sleeve means, provided radially inward of said winding support means, for guiding said armature during its movement including a magnetically conductive supporting element provided on its inner surface with a non-magnetic low friction coating adapted to contact said armature so as to define an air gap facing said armature and a low friction bearing for said armature;

at least one stem extending from said armature;

first end piece means for closing one end of said housing;

second end piece means for closing the other end of said housing; and

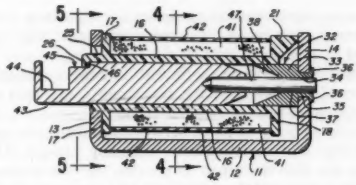
bearing means, provided in one of said first and second end piece means, for guiding said stem.

4,518,939

SOLENOID WITH RETAINER STOP

Reginald A. Read, LaGrange, and Richard N. Houston, Western Springs, both of Ill., assignors to Regdon Corporation, Brookfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,498
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—262 **18 Claims**



1. A solenoid device comprising an integrally molded bobbin provided with a central bore therein and including a resiliently retractable catch portion protruding into and partially closing said bore; a plunger extending into said bore and serving as an armature of such solenoid, said plunger adapted for axial, reciprocating movement in said bore and having a cross-section providing interfering engagement with said catch portion in said bore, with first stop means for stopping engagement with said catch; second stop means for limiting movement of said plunger in an opposite direction; and coil means surrounding said bobbin for generating magnetic flux to move said plunger; said plunger being formed of material having high magnetic permeability whereby said plunger may be inserted in said bore by resilient retraction of said catch portion and thereafter will engage said first and second stop means.

4,518,940

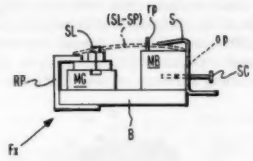
BACK-BAR ATTACHMENT AND ASSOCIATED FIXTURE

Otto Fuchs, Westlake Village, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 3, 1981, Ser. No. 299,096
Int. Cl.³ H01F *7/20*
U.S. Cl. 335—285 **19 Claims**

1. A fixture for attaching a back-bar means to core legs of a magnetic recording slider assembly comprising:

magnetic block means adapted to project a prescribed magnetic flux through said core legs to attract and hold said back-bar means;



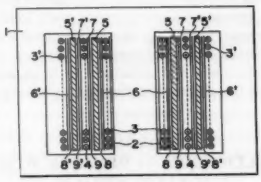
plus means for holding said slider registered with said block means.

4,518,941

PULSE TRANSFORMER FOR SWITCHING POWER SUPPLIES

Hajime Harada, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,458
Int. Cl.³ H01F *15/04, 15/15*
U.S. Cl. 336—69 **1 Claim**



1. A pulse transformer for use in a switching power supply, comprising a common core, primary and secondary windings wound concentrically around said common core, one of said primary and secondary windings being disposed inwardly of the other, including another winding wound around the other winding and connected parallel to said one winding, a first pair of electrostatic shield foils interposed between said one winding and said other winding, a second pair of electrostatic shield foils interposed between said other winding and said another winding, and an insulator interposed between said electrostatic shield foils in each of said first and second pairs of foils, and connecting wires drawn from said electrostatic shield foils at points thereon where pulsed electromotive forces are induced which are of equal levels as seen from leading ends of the electrostatic shield foils.

4,518,942

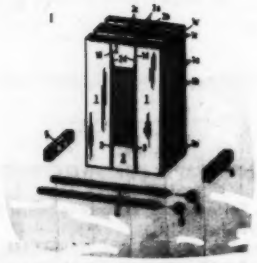
ELECTRIC MACHINE, SUCH AS TRANSFORMER CHOKE, CONSTANT-VOLTAGE REGULATOR OR THE LIKE

Hugo-Werner Geschka, Düsseldorf, Fed. Rep. of Germany, assignor to E. Blum GmbH & Co., Vaihinsen/Enz, Fed. Rep. of Germany

Continuation of Ser. No. 292,024, Aug. 11, 1981, abandoned, which is a continuation of Ser. No. 73,523, Sep. 7, 1979, abandoned. This application Apr. 18, 1984, Ser. No. 601,115
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839114
Int. Cl.³ H01F *27/26, 41/02*
U.S. Cl. 336—178 **8 Claims**

1. An iron core for use in electric machines such as transformers, chokes, magnetic constant voltage regulators and the like, comprising a plurality of substantially rectangular first and second core parts, each of said core parts comprising a

plurality of parallel metallic laminations and said first and second core parts together defining joint abutments, the planes of the laminations of said core parts being parallel to the planes of the laminations of said second core parts, said first core parts having outer contours provided with clamping surfaces and the laminations of each of said first core parts and each of said second core parts including groups of laminations defining external channels extending and being open all the way between the clamping surfaces of said first core parts substantially transversely of said joint abutments and in substantial parallelism with the planes of said laminations, said groups of laminations having surfaces bounding the respective channels and being devoid of metal cuttings; and means for urging said first core parts against said second core parts in the regions of said joint abutments, including clamping members adjacent to said clamping surfaces and elongated clamping elements received in said channels and arranged to urge said clamping members against the respective clamping surfaces.



4,518,943

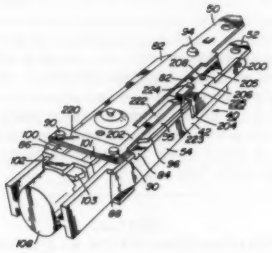
BIMETALLIC CIRCUIT BREAKER WITH AN AUXILIARY SWITCH

George J. Giessner, Cherry Hill, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Continuation of Ser. No. 426,237, Sep. 28, 1982, abandoned. This application May 7, 1984, Ser. No. 607,428

Int. Cl.³ H01H *71/16*

U.S. Cl. 337—68 **4 Claims**



1. In a circuit breaker the combination of;

a case having an end wall,

circuit breaker structure including circuit breaker contacts within said case,

a pair of main terminals connected to each of said contacts extending through and out from said end wall, said main terminals being disposed parallel to each other,

a frame within the case,

an auxiliary terminal extending from a stationary auxiliary contact within the case on the frame through and out from said end wall, said auxiliary terminal being disposed at right angles to and intermediate said main terminals,

an auxiliary movable blade including a movable contact arranged to make contact with the stationary auxiliary contact and electrically connected to one of said main terminals,

an insulator slide within the case slidably mounted on the frame and movable from a first position assumed when the circuit breaker contacts are closed to a second position when the circuit breaker contacts are opened, said slide engaging said movable blade and keeping it separated from said stationary contact when said slide is in its first position and releasing said blade when said slide is in its second position to permit said movable contact of said blade to engage said stationary contact of the auxiliary stationary terminal.

4,518,944

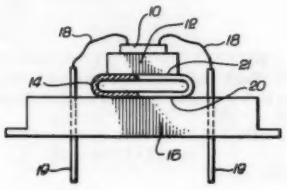
TEMPERATURE STABILIZER

Alan E. Faris, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 18, 1983, Ser. No. 542,919

Int. Cl.³ H01C *7/02;* **H01L** *41/08*

U.S. Cl. 338—22 R **7 Claims**



1. A temperature-stabilizing device for regulating the operating temperature of an electronic component that is to be mounted on a package, said device comprising:

a positive-temperature-coefficient thermistor mounted in thermal contact with the electronic component whose temperature is to be regulated; and

an insulating body mounted between said thermistor and the package, said insulating body including a length of tubing that has been deformed to provide two flat surfaces for contact with said thermistor and with the package, respectively, whereby the interior volume of said tubing increases the thermal resistance of the path between said thermistor and the package;

said tubing being of a material that produces no contaminant gases.

4,518,945

REMOTE CONTROL SYSTEM

Richard C. Doyle, Greenlawn, and Lester Rivera, Brooklyn, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 207,534, Nov. 17, 1980, Pat. No. 4,386,338. This application Sep. 30, 1982, Ser. No. 431,982

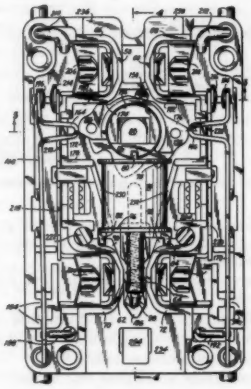
The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ H04Q *5/04*

U.S. Cl. 340—310 A **5 Claims**

1. Switching apparatus for selectively completing or interrupting an electrical connection between input and output conductors, or the like, comprising, in combination: a housing; a magnetizable armature disposed within a portion of said housing and being movable between first and second positions; electromagnet coil means disposed within said housing for moving said armature when energized from the first position to the second position; an input contact electrically connected to said input conductor; an output contact electrically connected to said output conduct; strap means for mounting the switching apparatus upon a selected surface, said strap means including portions thereof which define a path of the magnetic field

generated by said coil means to influence the position of said armature, and movable cam means responsive to movement of said armature for influencing a separation of said input and output contacts, thereby interrupting electrical connection between them, said apparatus further including movable actuating means having portions thereof in contact with said armature means for influencing the position of said cam means, said movable actuating means including kicking means for contacting and causing alternating rotary and counter-direction rotary movements of said cam means in response to movement of said armature, said rotary and counter-direction rotary movements causing electrical paths to open and close, said movable cam means being formed with an opening therethrough, thereby providing a recess into which a conducting pin of an electrical plug is able to be positioned, during use, without interfering with the operation of both the cam means and parts with which it cooperatively engages.



4,518,946

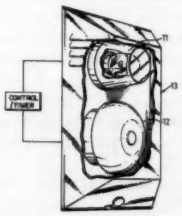
AUDIO-VISUAL ALARM DEVICE WITH TRANSLUCENT COVER

Dennis R. Solomon, Wallasey, England, assignor to CQR Security Systems Limited, Wallasey, England

Filed May 19, 1982, Ser. No. 379,873

Int. Cl.³ G08B *27/00*

U.S. Cl. 340—326 **4 Claims**



1. An alarm device comprising a housing enclosing an audible alarm means and a visual, light emitting warning means, said housing being formed of translucent material that shields the audible alarm and visual warning means from direct viewing while permitting the light emitted by the visual warning means to be transmitted therethrough, and means for operating each of said audible alarm means and said visual warning means.

4,518,947

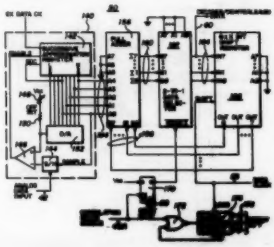
APPARATUS FOR DECODING REDUNDANT INTERLEAVED DATA

Billy R. Poston, St. Petersburg, and Carl F. Andren, Indiatlantic, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 306,489, Sep. 28, 1981, abandoned. This application Mar. 8, 1984, Ser. No. 586,996

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. A method for decoding a digital signal data stream having interleaved redundantly coded information bits, comprising the steps of:

(a) sampling each coded information bit in a character string in the data stream to produce at least two quantitative samples for each sampled coded information bit;

(b) transferring said quantitative samples for the sampled bits to an adder;

(c) summing in said adder said quantitative samples for the sampled bits with cumulative quantitative samples for each coded information bit in the character string to produce summation samples for said character string;

(d) transferring said summation samples to a storage means to form said cumulative quantitative samples for said character string;

(e) repeating steps (a)–(d) for redundant occurrences of said character string in the data stream; and

(f) selecting a most significant digit of each of the summation samples to be a determined state of the redundantly coded information bits.

4,518,948

ANALOG-TO-DIGITAL CONVERTER

Frederik J. VanRoessel, Upper Saddle River, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,123

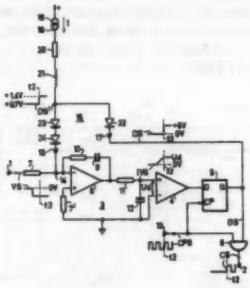
Claims priority, application Netherlands, Nov. 20, 1981, 8105254

Int. Cl.³ H03K *13/02, 13/20*

U.S. Cl. 340—347 NT **6 Claims**

1. An analog-to-digital converter incorporating a series arrangement between an input and an output terminal of the converter, comprising an integrating circuit, a comparison circuit, a flip-flop and a coincidence gate, a clock pulse input of the flip-flop and an input of the coincidence gate being connected to a clock pulse input terminal of the converter, the converter incorporating, provided in a feedback path, a switchable current source circuit, a current output terminal of which is connected to an input of the integrating circuit and which is further coupled to the input terminal of the converter, and a current source change-over terminal which is connected to an output of said flip-flop, characterized in that a first input of a differential amplifier incorporated in the integrating circuit is connected to the current source output terminal and to an amplifier output thereof via a series arrangement comprising a first capacitor and a first resistor, a second input being coupled to a terminal carrying a reference voltage and said output of this differential amplifier being coupled, via a series arrangement of a second resistor and a second capacitor, to said termi-

nal carrying a reference voltage, the junction between the second resistor and the second capacitor forming the output of the integrating circuit, and the product of the values of the first



capacitor and the first resistor being substantially equal to the product of the values of the second capacitor and the second resistor.

4,518,949

METHOD OF A/D CONVERSION BY SUCCESSIVE APPROXIMATIONS

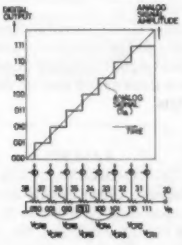
Tetsuro Kanai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 14, 1983, Ser. No. 504,153

Claims priority, application Japan, Jun. 15, 1982, 57-102616

Int. Cl.³ H03K *13/03*

U.S. Cl. 340—347 AD **1 Claim**



1. A method of A/D conversion by successive approximations, wherein a sampled analog signal is converted into a n-bit digital signal (wherein "n" is a positive integer) by successively approximating a comparison reference signal to said sampled analog signal through successive comparisons therebetween, which method comprises:

setting initially all the bits of the approximation control code to logic "1" except for the MSB which is set to logic "0";

comparing said sampled analog signal with said comparison reference signal, and at the m-th comparison step (m=1, 2, 3, . . . , n), (a) when the analog signal is greater than the comparison reference signal which is proportional to said approximation control code, replacing the m-th and (m+1)th MSBs of said approximation control code with logics "1" and "0" respectively, and, (b) when the analog signal is less than the comparison reference signal, replacing the (m+1)th MSB of said approximation control code with logic "0"; and

repeating the above comparison step until the "n" times of comparison are completed.

4,518,950

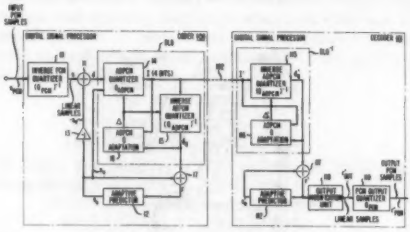
DIGITAL CODE CONVERTER

David W. Petr, Red Bank, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 22, 1982, Ser. No. 435,968

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **11 Claims**



1. A coder for converting digital samples from a first code to a second code including,

means for converting samples in said first code to linear versions thereof,

quantizer means supplied with said linear first code samples for generating corresponding samples in said second code, said quantizer means characterized by,

means for controllably modifying said second code sample values, in accordance with prescribed criteria including selecting between a preliminary second code sample value and second code sample values adjacent to said preliminary second code sample value generated by said quantizer means by evaluating at least one second-to-first code conversion quantization error value, so that a next subsequent coder will ultimately generate the same value second code samples as said quantizer means.

4,518,951

INTEGRATED CIRCUIT FOR A KEYBOARD OF AN ELECTRONIC APPARATUS

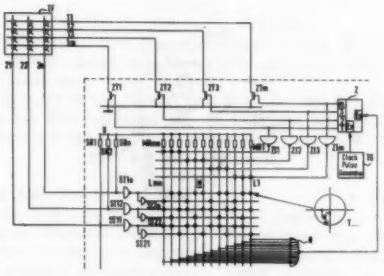
Reiner Backes, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,617

Claims priority, application European Pat. Off., Jul. 10, 1981, 81105385.9

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 S **2 Claims**



1. An integrated circuit for electronic keyboard apparatus, said keyboard apparatus comprising a plurality of pushbutton keys each having a pair of contacts, said contacts being connected in a matrix array such that a first one of each of said pair of contacts is connected to one of n first column lines and that the other one of each of said pair of

contacts is connected to one of m row lines so that when one of said pushbutton keys is operated the one first column line and the one row line connected to said pushbutton key are directly connected together,

said integrated circuit comprising:

n first inverters each having its input connected to one of said n first column lines and to an operating potential via one of a plurality of first resistors;

m row transistors, each of said row transistors having its controlled current path permanently connected to one of said row lins and to the zero point of said circuit;

a clock pulse generator;

a counter havng a count input coupled to said clock pulse generator, having m count outputs and adapted to cyclically count to m, and further having an enable input;

each of said row transistors having its gate connected to one of said m count outputs;

m row inverters each having its input connected to one of said m count outputs;

a matrix comprising a plurality of column lines arranged as m line groups of n lines each, a l-ex-m-times-n code appearing at said plurality of column lines

a plurality of second resistances each having one end connected to said operating potential and each having its other end connected to a different one of said n column lines of said line groups;

said matrix comprising a plurality of matrix transistors each having one end of its controlled current path connected to said zero point of said circuit and each having the other end of its controlled current path connected to a different one of said second resistances, said plurality of matrix transistors being arranged as m groups of transistors, all of the matrix transistors of each group having their control terminals commonly connected, each group of transistors having its commonly connected control terminals connected to the output of a different one of said row inverters;

a plurality of second transistors each having its current controlled path connected between one of said column lines and said zero point of said circuit, said second transistors being arranged in a matrix arrangement having n pairs of row lines, said second transistors of a first one of each of said pairs of row lines each being connected to a corresponding column line in a different one of said line groups with said second transistors in different ones of said first one row lines being connected to different corresponding column lines in said line groups, said second transistors of the other one of each said pair of row lines being connected to the ones of said column lines that are not connected to said second transistors of said first one of said pair of row lines;

each of said first column inverters having its output connected to the control terminals of said second transistors which are in one of said other one of each of said pair of row lines;

n second column inverters each having its input connected to the output of a corresponding one of said first column inverters and having its output connected to the control terminals of said second matrix transistors which are in said first one row line of the pair of row lines having its said other one of said pair of row lines coupled to said corresponding one of said first column inverters;

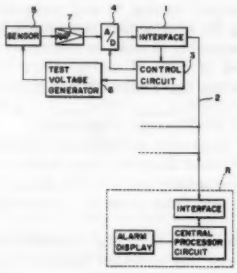
logic gate means having inputs coupled to all of said column lines and for providing a logic nor function or its equivalent and for generating a signal at an output coupled to said enable input of said counter.

4,518,952

SENSOR TEST CIRCUIT OF AN ALARM SYSTEM

Hiroshi Tanaka; Tetsuo Kimura, both of Tokyo; Seiichi Tanaka, Chiba, and Takashi Suzuki, Tokyo, all of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,465
Claims priority, application Japan, Sep. 10, 1982, 57-156598
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—514 **8 Claims**



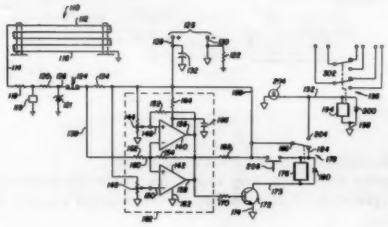
4. An alarm system test circuit responsive to a test instruction signal received from a remote control unit, comprising: control circuit means for recognizing a test instruction signal received from the remote unit; sensor means for detecting smoke, heat, or other alarm inducing parameters and having an analog voltage output indicative of an alarm parameter being sensed; and test voltage generator means activated by the control circuit means and connected to the sensor means for causing a predetermined analog voltage change from the sensor means useful in testing operation of an alarm system associated with the sensor means.

4,518,953

SECURITY FENCE SYSTEM

Kent Hunter, Frost Mill Rd., Mill Neck, N.Y. 11765, and Lawrence D. Hunter, 2509 Calle Montilla, Santa Barbara, Calif. 93109

Continuation of Ser. No. 198,889, Oct. 20, 1980, abandoned. This application May 31, 1983, Ser. No. 499,712
Int. Cl.³ G08B *13/22*
U.S. Cl. 340—564 **19 Claims**



1. A security fence system, comprising:

a plurality of fence posts arranged around a selected area;

a plurality of high tensile strength, highly stressed wires arranged substantially horizontal to the ground and being attached to said fence posts in a mutually spaced-apart relationship;

a resistor network interconnecting said plurality of wires one to another and forming an electrical circuit such that making an electrical connection between any two wires

will remove at least one resistor from said electrical circuit;

a voltage source connected to said circuit for causing a current of predetermined level to flow in said circuit; and

a sensing means connected to said circuit for providing an indication of changes in said predetermined current level;

a plurality of intermediate nonmetallic posts, at least one of which is arranged between said fence posts, each of said plurality of wires passing through each of said intermediate nonmetallic posts and further comprising a metal assembly arranged internal to said nonmetallic post, such that cutting the intermediate nonmetallic post will cause said metal assembly to make an electrical circuit between at least two of each of said plurality of fence wires, thereby altering said predetermined current level in said circuit.

19. A security fence system, comprising:

a plurality of fence posts arranged around a selected area;

a plurality of small diameter high tensile strength wires arranged substantially horizontal to the ground and being attached to said fence posts in a mutually spaced-apart manner;

each of said small diameter high tensile strength wires includes at least one annealed segment located between every two of said plurality of fence posts to which said wires are attached, said annealed segment having a lower tensile strength than the nonannealed portions of said wires.

4,518,954

DOZING WARNING DEVICE FOR A VEHICLE

Yasutoshi Seko, Yokohama, and Takayuki Yanagishima, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

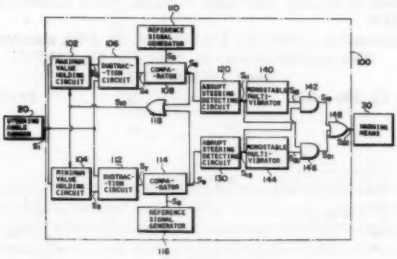
PCT No. PCT/JP81/00246, § 371 Date May 6, 1982, § 102(e) Date May 6, 1982, PCT Pub. No. WO82/00979, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 21, 1981, Ser. No. 377,268

Claims priority, application Japan, Sep. 22, 1980, 55-132059

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—576 **17 Claims**



1. A dozing warning device comprising:

steering angle detecting means for producing a signal S_1 representative of variations in the steering angular position;

first and second abrupt steering detecting means for producing first and second abrupt steering pulses S_{11}, S_{16} respectively when the value of an increase of the signal S_1 exceeds a value representative of a predetermined angle variation or when the value of the decrease of the signal S_1 exceeds said value, respectively;

means for producing a warning signal S_{22} when both of said abrupt steering pulses S_{11} and S_{16} are produced within a predetermined period of time T; and

warning means for producing a warning in response to said warning signal S_{22}.

4,518,955

METHOD AND APPARATUS FOR DETECTING LEAKAGE IN A FLUID CONDUIT SYSTEM

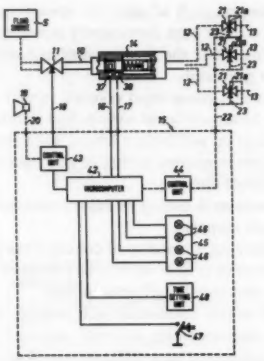
Knut Meyer, 2960, Rungsted Kyst, Denmark

Filed May 4, 1982, Ser. No. 374,799

Claims priority, application Denmark, May 6, 1981, 2007/81

Int. Cl.³ G08B *19/00*; F16K *17/00*

U.S. Cl. 340—605 **9 Claims**



1. A method of detecting leakage in a conduit system communicating with a supply source of a pressurized fluid to be consumed and having at least one selectively operable fluid drain, said method comprising:

A. detecting by means of a flow detector capable of detecting possible fluid flows exceeding at least two predetermined flow values, at at least one location of the conduit system, a possible fluid flow exceeding a predetermined first value and a possible fluid flow exceeding a predetermined second value, substantially greater than said first value;

B. supplying from said flow detector to a control device a first detecting signal, when a fluid flow exceeding said first value has been detected, and a second detecting signal when a fluid flow exceeding said second value has been detected by said flow detector;

C. supplying a first emergency signal from said control device, when the duration of said first detecting signal has uninterruptedly exceeded a predetermined first period of time, and

D. supplying a second emergency signal from said control device when the duration of said second detecting signal has exceeded a predetermined second period of time which is substantially shorter than said first period.

4,518,956

ELECTRIC LIQUID LEVEL DETECTOR

Junji Kitagawa, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 7, 1982, Ser. No. 366,387

Claims priority, application Japan, Apr. 13, 1981, 56-52783[U]

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—620 **6 Claims**

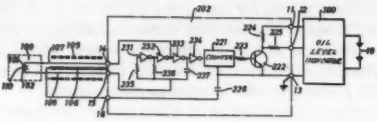
1. An electric liquid level detector of the condenser type for detecting the level of remaining liquid within a liquid container, comprising:

an electrode assembly including a pair of electrodes arranged to be submerged into the liquid within said container;

a flexible tubular guide member of conductive material fixed at its one end to said electrode assembly and being grounded;

an elongated flexible partition plate of conductive material fixed at its one end to said electrode assembly and arranged within said guide member to subdivide the interior of said guide member into a pair of elongated spaces, said flexible partition plate being grounded;

an electric circuit assembly fixed to the other ends of said guide member and said flexible partition plate respectively



and being provided with an electric detecting circuit for generating an output signal indicative of the level of remaining liquid in dependence upon an electrostatic capacity between said electrodes; and

a pair of insulated electric wires extending through the subdivided spaces in said guide member respectively for connecting said electrodes to said electric detecting circuit.

4,518,957

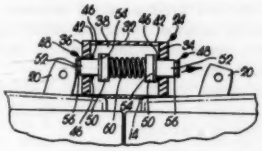
CIRCUIT BREAKER WARNING DEVICE

Rex W. Wheeler, 1202 S. Judson, Fort Scott, Kans. 66701

Filed Mar. 31, 1983, Ser. No. 480,938

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—639 **9 Claims**



1. In combination:

a circuit breaker box having a face plate with at least two laterally spaced apart, juxtaposed vertical rows of circuit breaker arm-receiving openings therethrough, there being individual circuit breakers behind said vertical rows of arm-receiving openings with shiftable breaker arms extending through respective ones of said arm-receiving openings, each of said arms normally being in a circuit closed position and shiftable from said circuit closed position to a circuit open position when the corresponding circuit breaker experiences sufficient electrical overload;

an alarm device for signalling when one or more of said circuit breakers has experienced an electrical overload sufficient to shift the associated breaker arm from the circuit closed to the circuit open position thereof, said device including:

shiftable means for each of said breaker arms respectively;

means mounting said respective shiftable means between said rows of arm-receiving openings and adjacent a corresponding breaker arm for movement of the shiftable means between a first and a second position in response to overload-induced movement of said corresponding breaker arm; and

means for giving a perceptible warning signal when one of said shiftable means has moved to said second position thereof.

4,518,958

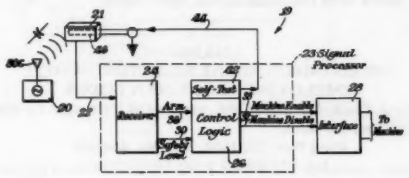
CAPACITIVELY COUPLED MACHINE TOOL SAFETY HAVING A SELF-TEST NETWORK

William A. Cook, Wilmington, Del.; Gary R. Hoffman, and William M. Pulford, both of Glen Arm, Md., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1982, Ser. No. 345,191

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—679 **15 Claims**



1. A machine tool safety system comprising:

an electric field generator adapted to be carried on a portion of the person of a machine tool operator for generating an electric field;

a capacitive receptor antenna mountable in a predetermined location with respect to a machine tool and cooperable with the electric field generator to form a capacitively coupled transmission arrangement operative to induce, by the action of the electric field through the capacitive coupling, a monotonically increasing electrical signal the magnitude of which is functionally related to the distance between the electric field generator and the capacitive receptor antenna;

a signal processor connected to the capacitive receptor antenna and responsive to the signal induced in the capacitive receptor antenna by the electric field to generate an indication when the magnitude of the induced electrical signal exceeds a predetermined threshold, the indication being able to be used to permit safe operation of a machine tool;

a self-test radiating antenna disposed in proximity to the capacitive receptor antenna; and

a self-test network electrically connected to the self-test radiating antenna for generating an excitation signal operative to induce in the capacitive receptor antenna a test signal having a magnitude greater than the threshold.

4,518,959

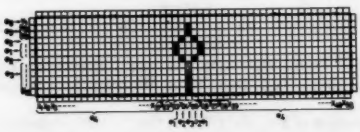
ELECTRONIC ANALOG DISPLAY DEVICE

Fumio Ueda; Yoshiaki Tsuboi; Hirotsugu Arai; Kenji Horikiri, and Hiroaki Ideno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,768

Int. Cl.³ G09G *3/34*

U.S. Cl. 340—784 **8 Claims**



1. An electronic analog display device for displaying a display pattern having a predetermined configuration, the position of said predetermined configuration in said display being variable in accordance with an input signal, said device comprising:

a display unit including a two-dimensional array of a plurality of electro-optical display elements each energizable in accordance with signals applied to its two inputs;

coupling means for coupling one input of each element in a row to a corresponding row conductor extending in a row

direction, and for coupling another input of each element in a column to a corresponding column conductor extending in a column direction; and

control means for applying to each row and column conductor one of a predetermined number of control signals selected in accordance with the value of said input signal, said predetermined number being less than the number of said row and column conductors, to select a group of said elements defining said predetermined configuration at a position along said row direction which varies in accordance with the value of said input signal.

4,518,960

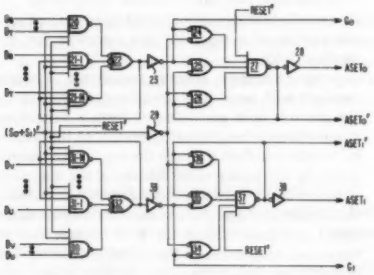
SPEED INDEPENDENT SELECTOR SWITCH EMPLOYING M-OUT-OF-N CODES

Becky J. Clark, Del Mar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 23, 1982, Ser. No. 444,063

Int. Cl.³ H04Q *9/00*; H04J *6/00*

U.S. Cl. 340—825.02 **10 Claims**



1. A selector comprised of:

one input port and two output ports, said input port having N input data lines and each of said output ports having N output data lines;

means for selecting only one of said two output ports at a time;

means for passing characters from said input port to said selected output port;

each of said characters being represented by active logic signals that asynchronously occur with respect to each other on M-out-of-N data lines of said input port, with M being at least two and N being greater than M and greater than three; and

said means for passing including means for detecting when M of said active logic signals are present on said N data lines of said input port and for initiating their passage to said output port in response thereto.

4,518,961

UNIVERSAL PAGING DEVICE WITH POWER CONSERVATION

Walter L. Davis, Plantation, Fla., and Kuppuswamy Raghunathan, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 192,779, Oct. 1, 1980, abandoned. This application Jan. 30, 1984, Ser. No. 575,472

Int. Cl.³ G08B *5/22*

U.S. Cl. 340—825.44 **103 Claims**

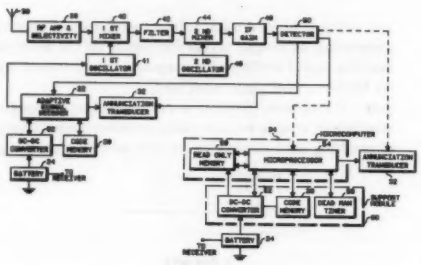
1. A communication system message receiving device for decoding signals transmitted in accordance with one of a plurality of multi-bit different word length information encoding formats comprising:

a communication receiver for detecting encoded signals transmitted over a communication channel;

a power source;

a data sampler, coupled to said power source and to said receiver to process said detected encoded signals in real time and to process said detected signals in accordance with any one of a plurality of information decoding formats corresponding to said plurality of information encoding formats;

coding format selection means, coupled to said receiver and said data sampler, including identification means responsive to predetermined characteristics of said detected encoded signals for identifying the format of the transmitted message, said selection means automatically selecting, in response to said identification means, which of said plurality of information decoding formats will be utilized for processing said detected encoded signals;



a code memory coupled to said selection means containing predetermined sequences of decoded signals corresponding to each of said plurality of information encoding formats;

comparison means, coupled to said data sampler and said code memory, for determining if said decoded signals correlate to said predetermined sequence of decoded signals for the selected information decoding format, said comparison means producing a control signal if said signals correlate and;

annunciation means coupled to said comparison means and responsive to said control signal for signalling the user of the reception of a message.

4,518,962

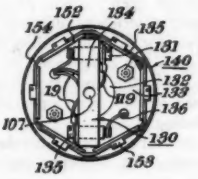
DEVICE FOR TRANSMITTING MEASUREMENT DATA FROM A ROTATING BODY

Kazuo Imose, Ashiya; Kiyoshi Yamamuro, Kokubunji; Hironori Takeuchi, Tachikawa, and Takashi Misawa, Tokyo, all of Japan, assignors to Teijin Limited and Fuji Electric Co., Ltd., both of, Japan

Filed Dec. 17, 1981, Ser. No. 331,552

Int. Cl.³ H05K *1/11, 1/14, 7/14*; G08G *19/12*

U.S. Cl. 340—870.28 **10 Claims**



1. An apparatus for a signal transmitter for mounting on the axis of rotation of a rotating body, comprising a rotary printed circuit board assembly further comprisprising at least two generally planar printed circuit boards having electronic components mounted thereon, said circuit boards being mounted in

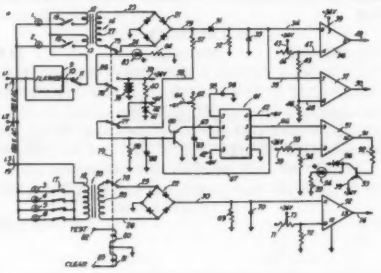
said assembly so that when the rotating body rotates, the resultant centrifugal force acting on the electronic components will be substantially free of net vector force components directly urging the electronic components away from the plane of the printed circuit boards, including a bobbin-shaped attachment base having a pair of flanges, and wherein components are secured and mounted to the surfaces of said printed circuit boards which face radially inwardly, and wherein said printed circuit boards are mounted on said pair of flanges and around said attachment base in a circumferentially spaced and cylindrical arrangement.

4,518,963

AUTOMATIC INDICATOR FOR TOWER LIGHTS

Curtis F. Rogers, Jr., Rte. #5, Box 273, Fitzgerald, Ga. 31750

Filed Apr. 26, 1982, Ser. No. 371,799
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—981 **10 Claims**



1. A failure-detecting circuit for a signalling system having a top warning illumination and a flasher for intermittently energizing such top warning illumination, said circuit comprising the combination of:

means for producing a d.c. signal in response to energization of said top warning illumination and for producing an intermittent signal related to the "on" times of said flasher;

means responsive to said d.c. signal for detecting and indicating either when the top warning illumination has failed or when said flasher has failed in the "off" condition; and

means responsive to said intermittent signal for detecting and indicating when said flasher has failed in the "on" condition.

4,518,964

PULSE ARRIVAL TIME DETERMINING DEVICE, USE THEREOF IN DISTANCE-MEASURING EQUIPMENT AND MEASURING EQUIPMENT COMPRISING SUCH A DEVICE

Joseph Hetyei, Paris, France, assignor to Thomson-CSF, Paris, France

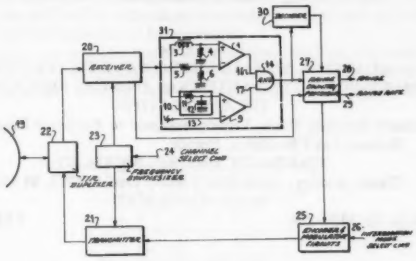
Filed Jan. 6, 1982, Ser. No. 337,367
Claims priority, application France, Jan. 9, 1981, 81 00315
Int. Cl.³ G01S *13/76, 7/28*
U.S. Cl. 343—7.3 **8 Claims**

7. A distance measuring equipment (DME) system having an airborne interrogator receiver and a ground transponder and having two operating modes, "enroute" and "in approach", said system including a video pulse arrival time determination device connected to the output of the ground transponder receiver, said device comprising:

(a) DAC (Delay And Compare) detector means, for receiving an input pulse signal, for delaying said input pulse signal, for attenuating said input pulse signal and for comparing said delayed signal and said attenuated signal to generate a first comparison signal;

(b) threshold detector means for receiving said input pulse signal for filtering said input pulse signal and for comparing said filtered signal and a threshold signal to generate a second comparison signal; and

(c) a coincidence circuit having its inputs respectively connected to said DAC detector means and threshold detector means outputs, for delivering an output signal representative of an arrival time of an interrogating pulse transmitted from said airborne interrogator.

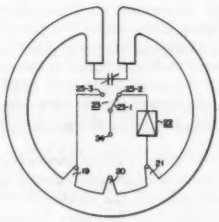


4,518,965

TUNED SMALL LOOP ANTENNA AND METHOD FOR DESIGNING THEREOF

Kazutaka Hidaka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 12, 1982, Ser. No. 348,206
Claims priority, application Japan, Feb. 27, 1981, 56-26910
Int. Cl.³ H01Q *11/12*
U.S. Cl. 343—742 **10 Claims**



1. A tunable small closed loop antenna, having an input admittance, for transmitting or receiving signals within the VHF and UHF frequency band and tunable over a wide range of resonant frequencies while substantially maintaining impedance matching between the antenna and an antenna feeder line comprising:

a loop conductor having a loop area A, circumferential length S and equivalent conductor radius b;

said loop conductor including feeding taps circumferentially spaced on said conductor wherein said taps are coupled to said antenna feeder line;

a capacitive element connected in series with said loop conductor for providng a resonant circuit having a loaded Q of not less than 20; characterizing in that said loop area, said circumferential length and said equivalent radius are selected so that the ratio of the resonant frequency f_o of said resonant circuit and the resonant frequency fm, at which said input admittance is a minimum, is within the range: $0.5 \leqq f_o/f_m \leqq 3.0$

whereby the selected values of A, S and b satisfy the following equation:

$$\frac{A^2 b}{S} = 5.43 \times 10^{28} \sqrt{\frac{\mu}{\sigma}} \cdot f_m^{-\frac{7}{2}}$$

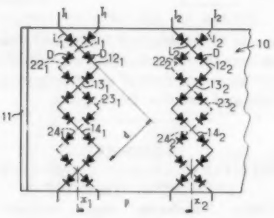
where μ is the permeability of the medium and σ is the conductivity of the loop conductor, and f_m has a value which falls within said range for various resonant frequencies f_o existing within a predetermined frequency band.

4,518,966

ADAPTIVE SPATIAL MICROWAVE FILTER FOR MULTIPOLARIZED ANTENNAS AND THE PROCESS OF ITS APPLICATION

Henri Sadones, Paris, France, assignor to Societe d'Etude du Radant, Les Ulis Cedex, France

Filed Sep. 29, 1982, Ser. No. 426,379
Claims priority, application France, Oct. 5, 1981, 81 18674
Int. Cl.³ H01Q *17/00*
U.S. Cl. 343—754 **4 Claims**



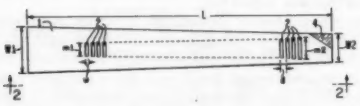
1. A microwave filter positionable in front of a radar antenna for attenuating or cancelling secondary lobes of a microwave beam, the filter comprising:
a plurality of first zig-zag planar networks, each having conductors serially connected to diodes biased in the same direction and lying along respective parallel axes;
a second plurality of zig-zag networks, each having conductors serially connected to diodes biased in the same direction and lying in a parallel spaced plane with respect to that of the first networks, the second zig-zag networks being the mirror image of the first and lying along respective parallel axes; and
terminal means connected to respective networks for conducting control currents of adjustable values therethrough which varies the resistance of the diodes accordingly, thereby attenuating or cancelling secondary lobes of the microwave beam without affecting the primary lobes regardless of polarization type.

4,518,967

TAPERED-WIDTH LEAKY-WAVEGUIDE ANTENNA

Charles W. Westerman, El Toro, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Mar. 5, 1982, Ser. No. 354,992
Int. Cl.³ H01Q *13/20*
U.S. Cl. 343—771 **16 Claims**



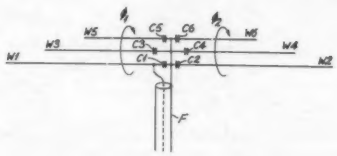
1. A slotted waveguide antenna comprising:
an elongated hollow conductive waveguide having two ends and two elongated faces, one end being fed with electromagnetic energy which then propagates along within the waveguide towards its other ends;
cut out of one of the faces, several elongated slots each having its long axis substantially orthogonal to the long axis of the waveguide;
wherein the width of the slotted face decreases as the waveguide is traversed in the direction of transmitting propagation; and
the length of the slots increases as the waveguide is traversed in the direction of transmitting propagation; wherein
the antenna has been fabricated by selecting slot length that give a desired sidelobe pattern; and
the width variations of the slotted face have been selected to compensate for changes in wave propagation velocity caused by the variable slot lengths, in such manner that the wave propagation velocity is kept substantially constant along the length of the waveguide.

4,518,968

DIPOLE AND GROUND PLANE ANTENNAS WITH IMPROVED TERMINATIONS FOR COAXIAL FEEDERS

Maurice C. Hately, Aberdeen, Scotland, assignor to National Research Development Corporation, London, England

Filed Sep. 7, 1982, Ser. No. 415,545
Claims priority, application United Kingdom, Sep. 10, 1981, 8127439
Int. Cl.³ H01Q *9/16*
U.S. Cl. 343—802 **23 Claims**



1. A multiband ground plane antenna, comprising:
a structure having a ground plane conductor and at least two spaced apart elongated conductor portions of different lengths normal to the ground plane conductor and in close proximity with one another, one end of each elongated conductor portion being adjacent to the ground plane conductor;
a respective capacitor associated with each of said conductor portions except the longest, each said capacitor connecting said one end of said associated conductor portion to said ground plane conductor, respectively and
first and second connecting points, for the connection of the inner and outer conductors of a coaxial feeder, connected to one end of the longest conductor portion and the ground plane conductor, respectively,
each of said capacitors providing a phase shift of several tens of degrees between voltage and current applied thereto at a frequency at which the conductor portion connected to that capacitor has a resonant length.

4,518,969

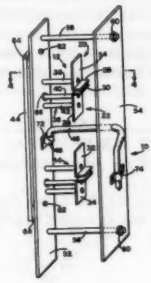
VERTICALLY POLARIZED OMNIDIRECTIONAL ANTENNA

Richard D. Bogner, Roslyn, N.Y., assignor to Leonard H. King, Valley Stream, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,397
Int. Cl.³ H01Q *19/30, 19/10*
U.S. Cl. 343—819 **26 Claims**

1. An antenna for producing an omnidirectional radiation pattern comprising:
at least one dipole having a pair of electrically conductive arms extending oppositely along a common axis from a feed point;
feeding means connected to said feed point for coupling said dipole to a signal source of a wavelength λ where λ is the wavelength of interest;
and a pair of opposing axially extending electrically conductive reflecting members spaced apart on opposite sides of said dipole, said members having a width of less than $\lambda/4$ transverse to the axis of the dipole, the respective axis of

each of said conductive members and said dipole arms being coplanar and parallel;



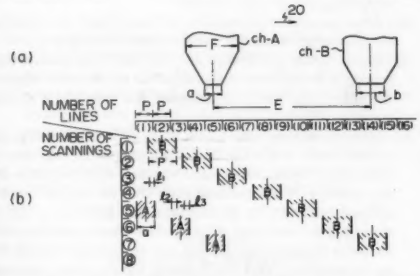
whereby the polarization of the antenna is transverse to the plane of omnidirectionality.

4,518,970

METHOD FOR FORMING A LATENT IMAGE AND APPARATUS FOR CARRYING OUT THE SAME

Norio Kokaji, Hino, and Kunio Kinoshita, Hachioji, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 370,135, Apr. 20, 1982, abandoned.
This application Sep. 18, 1984, Ser. No. 652,160
Claims priority, application Japan, Apr. 21, 1981, 56-60318
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.2 **4 Claims**



2. A method of forming latent images in a magnetic printing apparatus comprising the steps of:

a. recording latent images on a plurality of channels of different widths as measured in the main scanning direction, the tracking locus of each of said differentwidth channels corresponding to a different number of lines in the sub-scanning direction;

b. controlling the recording by selecting and driving at least two channels of different widths such that the line-recorded latent images of a wider channel are reduced in width by subsequently recorded latent images of a succeeding narrower channel which overlaps an edge portion of said wider channel, thereby to provide data tracks in the sub-scanning direction which are of substantially equal width as measured in the main scanning direction, and without unrecorded line space therebetween.

4,518,971

THERMAL HEAD

Takafumi Endo, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

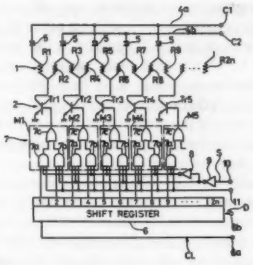
Filed Dec. 21, 1983, Ser. No. 563,750
Claims priority, application Japan, Dec. 29, 1982, 57-229804
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **2 Claims**

1. A thermal head for use in thermally recording data, the thermal head comprising:

a heating resistor group including 2n pieces of heating elements;

n pieces of buffer elements for driving said heating elements, wherein said heating elements are adjacently paired for one said buffer element so as to enable one of said paired heating elements to be energized;

a first common electrode and a second common electrode for energizing said heating elements through said buffer elements, wherein said heating elements are adjacently



paired for being connected alternately to said first common electrode and said second common electrode;

a 2n-bit shift register for storing printing data for said heating resistor group; and

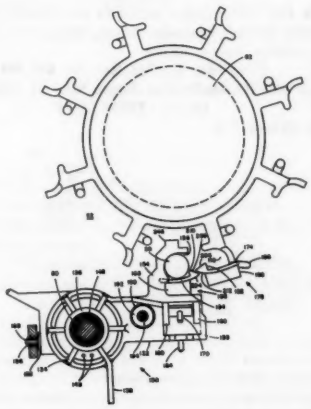
n pieces of multiplexors each for selecting one of the 2 bit signals adjacently located in the parallel outputs of said shift register according to the output timing of said first common electrode or said second common electrode, thereby applying said selected signal to said buffer elements.

4,518,972

GRAPHICS PLOTTER TURRET HEAD

Charles Gunderson, Bueno Park, and Henry W. Hammond, Yorba Linda, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 23, 1984, Ser. No. 633,174
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—139 R **4 Claims**



1. In a graphics plotter, a turret head assembly for holding a plurality of liquid ink pens on a pen carriage adjacent the point of writing and for selectively exchanging the pens to be the writing pen, said turret head assembly comprising:

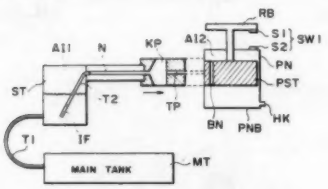
(a) a base plate member carried by the pen carriage;
(b) a turret mounted to said base plate member for rotary motion about a first axis normal to said base plate member;
(c) first drive means for selectively rotating said turret about said axis between previously selected main positions and sub-positions of each of said main positions, said main positions being radially equally spaced and equal in number to the number of pens to be carriable by the turret head, said sub-positions being equal in number to said main positions and each being a fixed radial distance from its respective main position, one of said main positions being designated as the writing position and one of said main positions being designated as the home position with respect to which said main positions are numbered for identification purposes, said base plate member having access therethrough adjacent said writing position through which the writing tip of a pen can pass to contact a writing medium disposed below said plate member for writing thereupon;
(d) a plurality of first pen gripping arms extending radially outward from said turret horizontal to said base plate member at respective ones of said main positions, said arms each having first gripping means for releasably gripping a pen along one edge adjacent the outer end thereof;
(e) a pen holder member mounted to said base plate member for movement up and down along a second axis normal to said base plate member between raised and lowered positions;
(f) second drive means for selectively moving said pen holder member between said raised and lowered positions; and,
(g) a second pen gripping arm extending radially outward from said pen holder member horizontal to said base plate member along a radial line through said first axis, said second arm being disposed adjacent said writing position and adapted to pass vertically between adjacent ones of said first arms and to pass below said first arms when said pen carriage member is in said lowered position and said turret is rotated, said second arm having second gripping means for releasably gripping a pen adjacent the outer end thereof and facing towards said first gripping means, said first and second gripping means being adapted to exchange a pen from one gripping means to the other when they are brought together.

4,518,973

INK JET PRINTER VACUUM PURGING SYSTEM

Shigemitsu Tazaki, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,301
Claims priority, application Japan, May 11, 1982, 57-77547
Int. Cl.³ E01D *15/18*
U.S. Cl. 346—140 R **11 Claims**



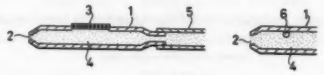
1. An ink jet printer comprising:
a recording head for discharging ink from an end of thereof;
capping means for releasably sealing said end of said recording head;
suction means connected to said capping means for sucking said end of said recording head through said capping means by producing a negative pressure;
detection means associated with said suction means for detecting the sucking operating of said suction means; and
indication means for providing an indication that the sucking operation of said suction means is in progress on the basis of detecting signal from said detection means, and terminating the indication when the pressure at said end of said recording head reaches a predetermined level.

4,518,974

INK JET AIR REMOVAL SYSTEM

Takuro Isayama, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 21, 1982, Ser. No. 420,865
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **12 Claims**



1. An ink jet printing system for printing an image in the form of dots of ink droplets on a recording medium comprising:
a nozzle defining an ink chamber for containing a quantity of ink, said nozzle being provided with an ink discharging hole through which the ink is discharged out into the atmosphere;
an ink reservoir connected to a supply side of said nozzle for supplying ink to said nozzle;
ink drive means for driving the ink inside said ink chamber to be discharged through said ink discharging hole;
detecting means connected to said ink drive means for detecting the fact that the amount of air bubbles trapped in the ink inside said ink chamber has reached a predetermined level; and
ink drawing means with a first state of non-activation and a second state of activation as responsive to said detecting means and connected to said nozzle for temporarily drawing said ink in said nozzle such that an air-ink boundary defined between the atmosphere and said ink in said nozzle is pulled into said ink chamber over a predetermined distance thereby transferring the air bubbles in said ink to the atmosphere, said ink drawing means being returned to its first state after a predetermined time period has elapsed so that said ink chamber can be filled with ink free of air bubbles.

4,518,975

ELECTROSTATIC RECORDING APPARATUS

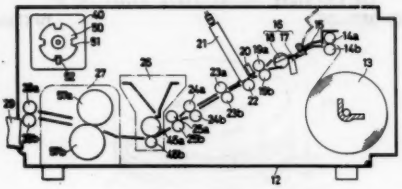
Yoshihiro Kawahara, and Kiyoshi Hayashi, both of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

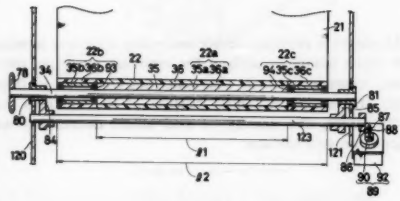
Filed Nov. 30, 1982, Ser. No. 445,475
Claims priority, application Japan, Nov. 30, 1981, 56-192381; Nov. 30, 1981, 56-192382; Nov. 30, 1981, 56-192384
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—153.1 **7 Claims**

1. An electrostatic recording apparatus for recording an image on sheets of recording paper of various widths, said apparatus comprising:
an electrostatic recording head for forming an electrostatic image on a sheet of recording paper;
a roller for pressing the sheet of recording paper against said recording head;
means mounting said recording head and said roller for relative displacement toward and away from each other between an operative position, whereat said roller presses the sheet of recording paper against said recording head during a first period of time in which the sheet of recording paper travels between said recording head and said

roller to enable said recording head to form the electrostatic image on the sheet of recording paper, and an inoperative position, whereat said roller is spaced from said recording head during periods of time other than said first period of time;

said roller comprising a first length portion and at least one second length portion mounted for free idling rotation relative to said first length portion; and





means for rotating said first length portion such that, with said roller and said recording head being in said operative position, when the sheet of recording paper has a width equal to the length of said first length portion, said second length portion is held stationary against said recording head, and when the sheet of recording paper has a width greater than said length of said first length portion, said second length portion is pressed against the sheet of recording paper and caused to rotate thereby.

4,518,976

RECORDING APPARATUS

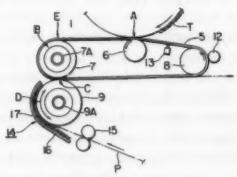
Noriyoshi Tarumi; Yukio Okamoto; Kiyoshi Kimura; Masakazu Fukuchi; Tadashi Miwa, and Kunio Ito, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,087

Claims priority, application Japan, Nov. 17, 1982, 57-201663; Dec. 13, 1982, 57-188217[U]

Int. Cl.³ G01D *15/06, 15/12;* **G03G** *15/00*

U.S. Cl. 346—153.1 **13 Claims**



1. In a recording apparatus including a toner image carrier, an intermediate image transfer member onto which is transferred said toner image on said toner image carrier and which further transfers said toner image onto a subsequent transfer material, and an image transfer section for transferring said toner image onto said subsequent material, said section comprising a transfer roller and a pressure roller pressing on said transfer roller, said recording apparatus comprising a pre-heating means for pre-heating said subsequent transfer material at a position prior to said image transfer section, said pre-heating means comprising a heat member and a pressing member which brings said subsequent transfer material into contact with said heat member, wherein at least one side of said pressing member facing said subsequent transfer material comprises a heat-resistant, elastically deformable porous material.

4,518,977

HEAT-SENSITIVE RECORDING SHEET

Fumio Fujimura; Toshimi Satake; Makoto Iwaguro, and Toshiaki Minami, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

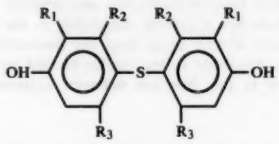
Filed Sep. 8, 1983, Ser. No. 531,173

Claims priority, application Japan, Sep. 14, 1982, 57-158821

Int. Cl.³ B41M *5/18*

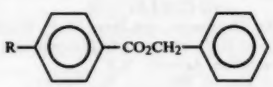
U.S. Cl. 346—209 **5 Claims**

1. A heat sensitive recording sheet having a color forming layer comprising a colorless basic dyestuff and an organic color-developing agent, said color-forming layer using a bis-(4-hydroxyphenyl) sulfide compound of the general formula (I) and a compound of the general formula (II) as a color-developing agent:

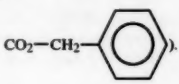


(I)

(in which R^1 represents an alkyl group with 1–4 carbon atoms or cyclohexyl group, and each of R_2 and R_3 represents an alkyl group with 1–10 carbon atoms or hydrogen atom, provided that at least one of R_2 and R_3 is not hydrogen atom),



(II)

(in which R represents or ).

4,518,978

SOLID STATE IMAGE SENSOR

Kaneyoshi Takeshita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,894

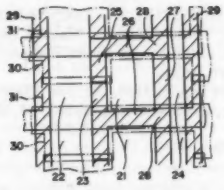
Claims priority, application Japan, Jul. 20, 1981, 56-113382

Int. Cl.³ H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **3 Claims**

1. A solid state image sensor comprising: a sensing and vertical transfer portion having a large number of sensing element regions each of said sensing element regions containing a photo-sensing area for producing and storing signal charges, a vertical charge transfer portion for vertically transferring the signal charges, a transfer gate area for transferring the signal charges to said vertical charge transfer portion from said photo-sensing area and a channel stopper area provided which surrounds said photo-sensing area and forms said trans-

fer gate area at a portion thereof, a horizontal charge transfer portion provided at one end of said sensing and vertical transfer portion for transferring horizontally the signal charges which have been transferred from said sensing and vertical transfer portion, a first transfer electrode extending over a first part of said vertical charge transfer portion and a part of said channel stopper area and located between two adjacent said photo-sensing areas, and a second transfer electrode extending over a second part of said vertical charge transfer portion, said



transfer gate area and said part of the channel stopper area, said second transfer electrode being placed over said first transfer electrode at the position of said part of said channel stopper area so that it is shielded from said part of said channel stop area by said first transfer electrode, and wherein said first transfer electrode has a greater dimension in the direction between adjacent sensing areas than the dimension of said second transfer electrode in the region of said part of said channel stopper in the direction between adjacent sensing areas.

4,518,979

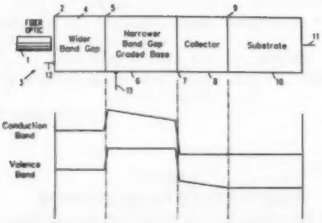
SEMICONDUCTOR TRANSISTOR WITH GRADED BASE AND COLLECTOR

William P. Dumke, Chappaqua, and Jerry M. P. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,923

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **8 Claims**



1. A transistor comprising in combination in an epitaxial layered monocrystalline structure,

an emitter layer having an energy gap of a first magnitude,

a base layer forming a first p-n junction with said emitter layer and having an energy gap of a second magnitude narrower than said emitter energy gap, said base energy gap decreasing with distance from said first p-n junction,

a collector layer including a substrate forming a second p-n junction with said base layer, said collector energy gap increasing with distance from said second p-n junction, and

an external electrical connection each to said substrate, to said base and to said emitter layer.

4,518,980

SEMICONDUCTOR DEVICE FOR THE VACUUM-EMISSION OF ELECTRONS

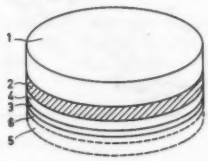
Pierre Guittard, Montlhery Longpont; Philippe Jarry, Sucy-en-Brie; Alphonse Ducarre, Sainte-Genevieve-des-Bois, and Lazhar Haji, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1982, Ser. No. 380,633

Claims priority, application France, Jun. 3, 1981, 81 10993

Int. Cl.³ H01L *29/161, 27/14, 31/00, 29/205*

U.S. Cl. 357—30 **10 Claims**



1. An electron emitting device including an active semiconductor layer having a surface for emitting electrons into a vacuum, characterized in that said active layer is doped through at least a substantial portion of its thickness with impurity atoms, the density of said atoms decreasing with distance from said surface.

4,518,981

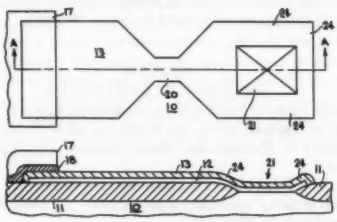
MERGED PLATINUM SILICIDE FUSE AND SCHOTTKY DIODE AND METHOD OF MANUFACTURE THEREOF

Ronald L. Schlupp, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 12, 1981, Ser. No. 320,368

Int. Cl.³ H01L *29/48, 27/02, 29/40, 23/48*

U.S. Cl. 357—71 **17 Claims**



1. In an integrated circuit formed at a surface of a semiconductor substrate, a merged fuse and Schottky diode device comprising:

an insulating layer having an aperture therethrough over said substrate surface,

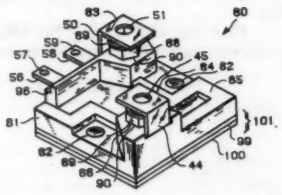
a silicon layer on said insulating layer and said aperture, said silicon layer shaped as an interconnecting line of said integrated circuit and having a first portion on said insulating layer and a second portion in contact with said substrate through said aperture, and

a metal silicide layer over said silicon layer having substantially the same shape as said silicon layer so that a first portion of said metal silicide layer over said first portion of said silicon layer has a cross sectional dimension so as to open by the application of electrical voltage greater than a preselected electric voltage and a second portion of said metal silicide layer over said second portion of said silicon layer forms a Schottky diode at said aperture.

4,518,982
HIGH CURRENT PACKAGE WITH MULTI-LEVEL LEADS

Jerry M. Du Bois, Mesa, and Keith G. Spanjer, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 238,799, Feb. 27, 1981, abandoned.
This application Sep. 20, 1983, Ser. No. 534,261
Int. Cl.³ H01L 23/34, 23/12, 23/48, 25/04
U.S. Cl. 357—74 15 Claims



1. A high current semiconductor device comprising:

a base electrode having a bent-up portion located substantially at one corner of said base electrode and extending at substantially a right angle from said base electrode, and having a bent-over portion extending from said bent-up portion forming a first external connection means;

wherein said base electrode has an elongated die attach portion having first and second long sides, and wherein said die attach portion is adapted to receive semiconductor die between said first and second long sides, wherein said elongated die attach portion extends away from said bent-up portion of said base electrode in a direction substantially parallel with said bent-over portion;

a first electrode having an elongated first planar portion bonded by insulating means to said base electrode along said first long side of said elongated die attach portion of said base electrode, a bent-up portion extending at substantially a right angle from an end of said elongated first planar portion, and a bent-over portion extending from said bent-up portion substantially parallel with said elongated first planar portion and aligned substantially parallel with said first long side of said die attach portion, wherein said bent-over portion forms a second external connection means;

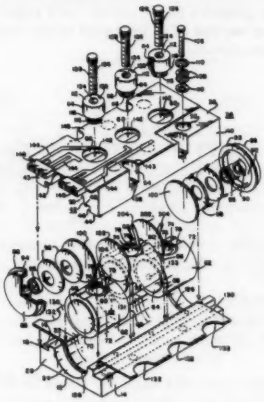
a second electrode, separate from said first electrode, having an elongated second planar portion bonded by insulating means to said base electrode along said second long side of said elongated die attach portion of said base electrode, a bent-up portion extending at substantially a right angle from said elongated second planar portion, and a bent-over portion extending from said bent-up portion substantially parallel with said elongated second planar portion and aligned substantially parallel with said second long side of said die attach portion, wherein said bent-over portion forms a third external connection means; and

encapsulating means adapted to cover said die attach portion of said base electrode, said elongated planar portions of said first and second insulated electrodes, and at least a part of said bent-up portions, leaving free at least part of said bent-over portions which form said external connection means.

4,518,983
ASSEMBLY-HEAT SINK FOR SEMICONDUCTOR DEVICES

Kenneth G. Longenecker, Greensburg, and Thomas B. Geary, Derry, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1982, Ser. No. 436,104
Int. Cl.³ H01L 23/34, 23/02, 23/04, 25/04
U.S. Cl. 357—81 8 Claims



1. A semiconductor modular assembly comprising, a metal base member and a metal top member, said base member having a top surface, a bottom surface and two end faces said top metal member having a top surface, a bottom surface and two end faces, a central portion of said top surface of said base member being curved and concave relative to said top surface, a central portion of said bottom surface of said top member being curved and concave relative to said bottom surface, whereby when said top member is disposed on said base member, the curved concave portions of said base and top member form a cavity between the end faces of said members, said cavity having a circular cross-section, a plurality of metal cylindrical members disposed within said cavity, semiconductor fusions disposed within said cavity between adjacent cylindrical members, compression means holding said semiconductor fusions in an electrical and thermal conductive relationship with said adjacent metal cylindrical members, means for electrically insulating said cylindrical members and said fusions from said base and top members, and means for making electrical contact to said semiconductor fusions through said cylindrical members.

4,518,984
DEVICE FOR FLICKER-FREE REPRODUCTION OF TELEVISION PICTURES AND TEXT AND GRAPHICS PAGES

Helmut Mitschke, Königsbach-Stein, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

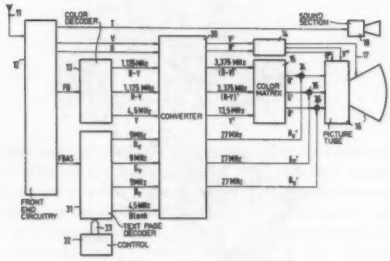
Filed Mar. 1, 1983, Ser. No. 471,075
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209876
Int. Cl.³ H04N 9/42, 9/535
U.S. Cl. 358—11 2 Claims

1. Television picture reproducer with digital frame store, wherein the video signal received from the transmitter at a given field and line frequency is sampled, and wherein the sample values are converted into digital data units, written into the frame store at a first frequency, the write frequency, read out of the frame store at a second frequency, the read fre-

quency, which is a multiple of the write frequency, returned to analog form, and reproduced on the screen at a higher field and line frequency, characterized in

that the reproducer contains a decoder for the selection and display of text and graphics pages (e.g., for Viewdata or Videotext), called "text-page decoder" (31) for short, which forms at least color signals (R_v, G_v, B_v) and a blanking signal (Blank),

that the frame store (221, 222, 223) is preceded by a multiplexer (26) which permits the (digital) color signals for the text and graphics pages, called "text pages" for short, to be stored instead of at least part of the data units for the television picture,



that the data units read from the frame store are separated into text-page and television-picture signals by a demultiplexer (27),

that the switchover of the multiplexer (26) and the demultiplexer (27) as well as the blanking of the respective picture or picture section not to be displayed is effected by the original or a suitably converted blanking signal (Blank),

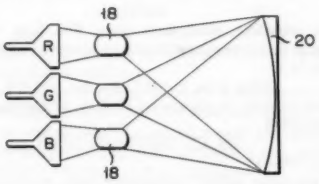
and that groups of n successive values of the color signals of the text page are simultaneously written into and simultaneously read from the frame store, for which purpose an additional multiplexer (25) with a buffer (251) and an additional demultiplexer (28) are inserted in the path of the text-page signal at the input end and the output end, respectively.

4,518,985

PROJECTION TYPE GREEN CATHODE RAY TUBE, METHOD FOR MANUFACTURING PHOSPHOR SCREEN FOR THE SAME, AND PROJECTION VIDEO DEVICE USING THE SAME

Masaaki Tamatani, Fujisawa; Nobuyuki Tsuda, Kawasaki; Norio Koike, and Sakae Ajiro, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 4, 1982, Ser. No. 384,947
Claims priority, application Japan, Jun. 10, 1981, 56-88251
Int. Cl.³ H04N *9/31*
U.S. Cl. 358—60 **7 Claims**



1. A projection type green cathode ray tube comprising:

a main body having a transparent faceplate;

a phosphor screen formed on the inner surface of said faceplate, said phosphor screen including a cerium-activated calcium sulfide phosphor which contains 0.01 to 0.3 mol % of cerium; and

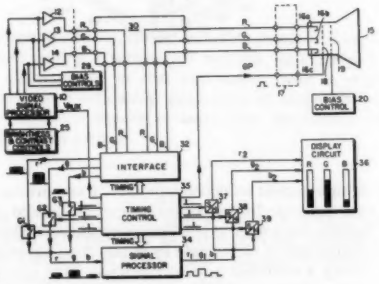
means housed in said main body for emitting an electron beam on said phosphor screen, said means being capable of radiating the electron beam with energy sufficient to project an image on said faceplate onto an external screen.

4,518,986

APPARATUS FOR ACCURATE ADJUSTMENT OF KINESCOPE BLACK LEVEL BIAS

Werner Hinn, Zollikerberg, and Hans-Rudolf Fecht, Berikon, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1982, Ser. No. 454,446
Claims priority, application United Kingdom, Apr. 6, 1982, 8210291
Int. Cl.³ H04N *9/62*
U.S. Cl. 358—65 **22 Claims**



1. In combination with a video signal processing system including an image reproducing device responsive to video information signals encompassing periodic vertical image field intervals each constituted by a plurality of horizontal image line intervals, control apparatus comprising:

means for suppressing normal video information signals during control intervals to simulate a black image signal input to said image reproducing device;

means coupled to said image reproducing device for deriving therefrom a composite signal representative of the black image bias condition of said image reproducing device, said composite signal comprising a reference component and a plurality of bias representative signal components which are derived during plural horizontal line intervals and which are significant in number relative to the number of horizontal line intervals associated with a vertical field interval;

signal processing means responsive to said composite signal and including means for integrating said composite signal; and

means for developing a bias control signal in response to an integrated composite signal from said integrating means.

4,518,987

THREE-COLOR COPYING MACHINE

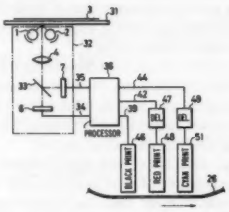
Hiroyuki Saitoh, and Masami Kurata, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,643
Claims priority, application Japan, Apr. 6, 1982, 57-55999
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—75 **6 Claims**

1. A three-color copying machine, comprising:

an optical system for forming an image of the picture data of an original at predetermined positions;

first wavelength selecting means for selecting the wavelength component of a particular color other than black;
second wavelength selecting means for selecting at least the wavelength component of the color complementary to said particular color;
a first image sensor for performing photo-electric conversion at one said predetermined position with respect to said wavelength selecting means with the aid of said optical system;
a second image sensor for performing photo-electric conversion at a second said predetermined position with respect



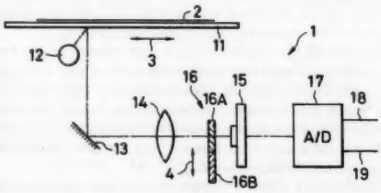
to said wavelength component selected by said second wavelength selecting means with the aid of said optical system;
a signal processing means for subjecting image signals outputted by said image sensors to binary-encoding and logical operations, to provide image signals representing black, said particular color and said complementary color; and
recording means for receiving said image signals from said signal processing section to perform recording in said colors, respectively.

4,518,988

TWO-COLOR COPYING MACHINE

Hiroyuki Saitoh, and Masami Kurata, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,642
Claims priority, application Japan, Apr. 6, 1982, 57-55997
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—75 **9 Claims**



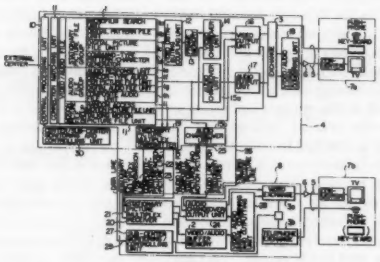
1. A two-color copying machine, comprising;
an image sensor for twice reading an original, to form analog image signals;
an optical system for applying image data respecting said original to said image sensor;
complementary color filter means which, in one reading of said original, is placed in said optical system in a manner so as to absorb wavelength components of a particular chromatic color to be read;
means for binary-encoding said analog image signals, to respectively form a first digital image signal for image data respecting an achromatic color and a second digital image signal for image data respecting the sum of said achromatic and chromatic colors;
an achromatic recording section receiving an ink donor sheet assembly and said first digital image signal for said image data respecting said achromatic color, for recording said achromatic color on said recording sheet;
a chromatic recording section receiving a part of said ink donor sheet assembly containing a chromatic ink layer and said second image signal respecting the sum of said achromatic and chromatic colors, for recording said chromatic color on said recording sheet; and means for preventing recording of said chromatic color over said recorded achromatic color on said recording sheet.

4,518,989

BUFFER MEMORY DISPERSION TYPE VIDEO/AUDIO TRANSMISSION SYSTEM WITH SPATIALLY AND TIMEWISE DIVIDED INTER-OFFICE JUNCTION LINES

Akira Yabiki, Tokyo; Norio Imanishi, Yokohama; Yoji Shibata, Yokohama; Wataru Kosuge, Yokohama, and Nobumichi Yukawa, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Continuation of Ser. No. 97,127, Nov. 26, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 428,971
Claims priority, application Japan, Nov. 24, 1978, 53-144159
Int. Cl.³ H04N *7/10*
U.S. Cl. 358—86 **14 Claims**



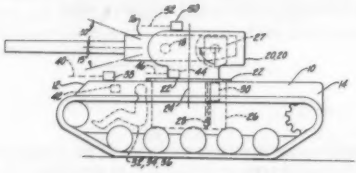
1. A buffer memory dispersion type video/audio transmission system with spatially and timewise divided interoffice junction lines comprising:
a center comprising:
a group of audio files for storing audio information;
a group of video files for storing video information;
means for fetching specific information from said audio and video file groups in response to an information request received at said center from a subscriber terminal unit and for dividing fetched video information into a luminance signal and a chrominance signal; and
means for transmitting said luminance signal with a superimposing signal in a time-divisional fashion by a first junction line and for transmitting said chrominance signal with an audio signal based on fetched audio information in a time-divisional fashion by a second junction line; and
a plurality of subcenters comprising:
a multiplex receiver for receiving said transmitted signals from said first and second junction lines;
video and audio buffer memories for temporarily storing video and audio information received by said multiplex receiver from said first and second junction lines; and
an audio output unit and a video output unit and an audio changeover unit and a video changeover unit for coupling said temporarily stored video and audio information to said subscriber terminal units.

4,518,990

OBSERVATION SYSTEM FOR MILITARY VEHICLES

Jaunutis B. Gilvydis, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 11, 1983, Ser. No. 512,516
Int. Cl.³ H04N 7/18, 5/26
U.S. Cl. 358—87 **3 Claims**



1. In a military ground vehicle that includes a hull having front and rear ends, a gun platform centrally mounted on the hull for rotational motion in the azimuth plane, two laterally-spaced gun-cradle walls extending upwardly from the platform, and a main gun centrally located in the space between said cradle walls for swinging ajustments in the elevational plane: the improvement comprising a first driver-controlled television camera located on the hull near its front end; means for adjusting said first camera so that its line-of-sight is movable in the azimuth and elevational planes; a first television receiver located within the hull at the driver's station; first cable connections between the first camera and first receiver, whereby the driver is enabled to view the terrain in front of the vehicle; a second television camera located on the rotary platform between the gun cradle walls and directly below the main gun, with its line-of-sight oriented on the elevational plane of the gun-aiming axis; a second television receiver located within the hull at the gunner's station; second cable connections between the second camera and second receiver whereby the gunner is enabled to train the gun on targets within the second camera field-of-view; a third commander-controlled television camera located at an elevated point on one of the gun cradle walls; means for adjusting said third camera so that its light-of-sight is movable in the aximuth and elevational planes; a third television receiver located within the hull at the commander's station; and cable connections between the third camera and third receiver whereby the commander is enabled to seek new targets while the gunner is firing the main gun at a previously-selected target.

4,518,991

APPARATUS FOR STORING AND PROCESSING ANALOGUE SIGNALS TO BE DISPLAYED AS AN OSCILLOSCOPIC IMAGE AND OSCILLOSCOPE COMPRISING SUCH APPARATUS

Pierre J. C. Dureux, Corbeil-Essonnes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,609
Claims priority, application France, Sep. 28, 1981, 81 18212
Int. Cl.³ H04M 7/18
U.S. Cl. 358—93 **10 Claims**

1. An apparatus for storing and processing arbitrary analog signals comprising

a camera having a target providing images for a temporary analog memory, said camera including a video scanning system for scanning said temporary analog memory, and a video preamplifier for converting electrical signals of said images into video frequency signals; and

a processing circuit receiving signals from said video preamplifier for processing said video frequency signals, said processing circuit including

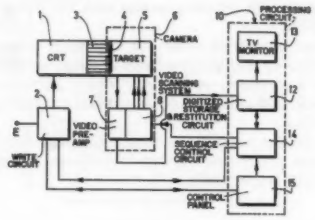
(a) a detection circuit for detecting an average black level value corresponding to used parts of said temporary analog memory, said detection circuit receiving output signals from said video preamplifier, and said detector circuit generating a reference threshold value by adding a constant voltage to said detected average black level value;

(b) an analog comparator circuit for receiving said output signals of said video preamplifier on a first input and for receiving said reference threshold value on a second input, said comparator circuit for providing a logic "1" signal only when said output values exceed said reference threshold value,

(c) a signal regenerator circuit receiving a signal from said analog comparator circuit for reconstructing missing parts of maximum instantaneous write signals, said missing parts having a duration shorter than a predetermined value, said signal regenerator circuit providing a binary signal representing said missing parts;

(d) a conversion circuit for converting said binary signal into a pulse train of the same duration as said missing parts, said duration being equal to at least a few pulse periods of said pulse train for restoring said missing parts, said conversion circuit providing an output signal;

(e) a change detector circuit for detecting positions of rising and falling edges of said output signal of said conversion circuit, said change detector circuit supplying pulse signals indicating beginnings and ends of said missing parts;



(f) a digital memory circuit for storing positions of said beginnings and ends of said missing parts, said memory circuit being loaded by an input buffer register having quantized values being defined by a digitization counter, said values indicating positions of said pulse signals providing beginnings and ends of said missing parts;

(g) a circuit for restitution of positions of instants characteristic of a beginning or an end of a missing part, said restitution circuit receiving values read into said digital memory circuit by an output buffer register circuit;

(h) a circuit for reconstructing said missing parts between positions of said beginnings and ends of said missing parts;

(i) a television monitor means for forming display of said images, said monitor means enabling display of contents of said digital memory circuit permanently, said contents being information corresponding to write signals in said temporary analog memory;

(j) a sequence control circuit providing a synchronous supply of clock signals for scanning said temporary analog memory and clock signals for converting said binary signal of said signal regenerator, said sequence control circuit controlling clock signals for said digital memory circuit, and said sequence control circuit providing an entire operator write circuit communication; and

(k) an accessible control panel.

4,518,992

ACOUSTIC IMAGING SYSTEM AND METHOD

Lawrence W. Kessler, Glenview, and Donald E. Yuhas, Wood Dale, both of Ill., assignors to Sonoscan, Inc., Bensenville, Ill.

Filed Nov. 17, 1982, Ser. No. 442,264
Int. Cl.³ H04N 5/30
U.S. Cl. 358—112 **51 Claims**

1. In an acoustic imaging system for generating a visual

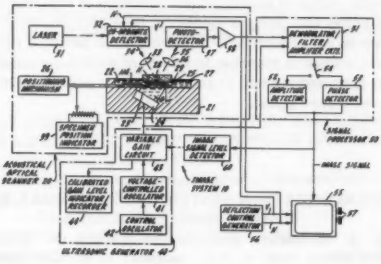
image representative of the acoustic properties of an object, of the kind including:

insonification means for insonifying the object with acoustic waves having a frequency above ten megahertz to develop a pattern of perturbations on an at least partially light-reflective interface surface, coupled to the object, which pattern is representative of acoustic properties of the object;

scanning means for scanning a high-energy small-diameter light beam across the interface surface;

photodetection means for detecting a portion of the light beam reflected from the interface surface to develop an initial electrical signal;

signal processor means, coupled to the photodetection means, for processing the initial electrical signal to develop an acoustic image signal;



and display means, coupled to the signal processor means, for utilizing the image signal to develop a visual image representative of acoustic properties of the object;

the improvement comprising:

image signal level determination means, coupled to the signal processor means, for detecting the amplitude level of the image signal;

and variable gain means, incorporated in the insonification means, for adjusting the intensity of the acoustic waves insonifying the object to afford an image signal level corresponding to a given reference level,

the adjustment of the variable gain means affording a quantitative measure of variation of acoustic properties of the object, relative to the reference, that minimizes the effects of inadequate dynamic range and non-linearities in the imaging system.

4,518,993

TELEVISION SIGNAL RECEIVING SYSTEM

Hisao Okada, Yokohama; Seiichiro Tanaka, Tokyo, and Seiji Kawaberi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 324,137

Claims priority, application Japan, Nov. 27, 1980, 55-167110

Int. Cl.³ H04N *7/16*; H04B *1/26*

U.S. Cl. 358—114 **20 Claims**

1. A television signal receiving system comprising:

tuner means;

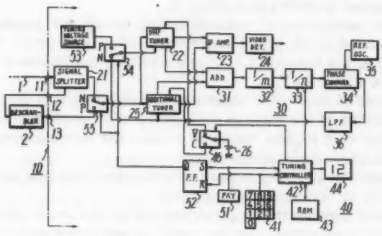
channel selecting means connected to said tuner means and actuable for selecting a plurality of television channels;

an input terminal for receiving television signals including standard television signals each transmitted through an allotted channel of said plurality of television channels which can be selected by actuation of said channel selecting means and a non-standard television signal transmitted through a television channel other than said plurality of television channels which can be selected;

signal splitting means connected to said input terminal and having first and second output terminals;

converting means connected to said first output terminal of said signal splitting means for converting said non-standard television signal to a converted standard television signal occupying a vacant one of said plurality of television channels which can be selected by actuation of said channel selecting means, said converting means having an output terminal;

switch means for connecting one of said second output terminal of said signal splitting means and said output terminal of said converting means to said tuner means; and



switch control means connected to said channel selecting means and said switch means for controlling said switch means upon actuation of said channel selecting means so that said switch means supplies one of said standard television signals and said converted standard television signal to said tuner means, and said channel selecting means is actuable to select any one of the received television signals for viewing.

4,518,994

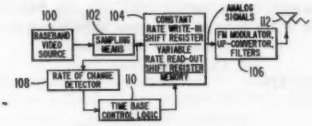
COMMUNICATION SYSTEM COMPANDOR

Paul Schnitzler, Kendall Park, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1982, Ser. No. 451,743

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—133 **3 Claims**



1. In a signal transmission system comprising a transmitter, a transmission medium, and a receiver, a system for processing a signal to improve the transmission characteristics thereof comprising:

first means for decreasing and increasing, respectively, the rate of change of amplitude (dA/dt) of first and second portions of said signal, respectively, whose dA/dt exceeds or is less than a predetermined dA/dt, in a non-linear manner as the dA/dt of said first and second portions increase or decrease, respectively, to produce a processed signal whose maximum and minimum dA/dt's define a bandwidth less than that of the unprocessed signal, said first means including

sampling means for sampling said signal into samples haing a given order of succession,

first timing means for generating first clock pulses at a rate f_c,

first N stage shift register means responsive to said first clock pulses to receive and store said samples in said given order,

a dA/dt detector responsive to said samples to determine the dA/dt of adjacent samples,

logic means responsive to the dA/dt of adjacent samples to produce and store a count value representative of the time

duration between such adjacent samples after the dA/dt has been decreased or increased in accordance with said non-linear rate,

adder means for adding the total count value of said count values over each successive group of N count values, where the group of corresponding N samples occupies a time period T,

means for determining the number of counts W by which said total count value exceeds or is less than a predetermined nominal count value X,

logic comprising a variable timing means for generating second clock pulses and responsive to said count W to alter the frequency f_2 of said second clock pulses so that $(X+W)/f_2=T$,

second N stage shift register means responsive to the completion of the entry of each group of N samples into said first shift register means to receive the samples stored in said first shift register means,

presettable counting means coupled to said logic and responsive to said second clock pulses,

second logic means for presetting said stored count values in said presettable counting means in said given order upon the entry of each group of N samples into said second shift register means from said first shift register means,

whereby said counting means responds to said second clock pulses to count through successive ones of said count values to output a shift signal each time said counting means counts through one of said count values, said second shift register is responsive to each of said shift signals to shift therefrom one of the samples stored therein; and

second means for altering the dA/dt of the processed signal at the receiver in a manner which is the reciprocal of the changes in dA/dt which occurred at said transmitter to reproduce said unprocessed signal.

4,518,995

SELECTABLE RATE SYNC GENERATOR SYSTEM

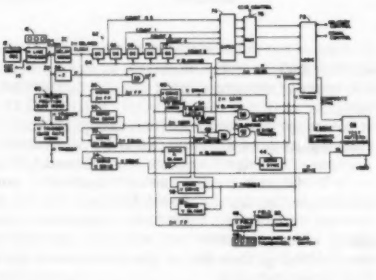
John H. Harshbarger, Xenia, and William M. Shores, Dayton, both of Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Division of Ser. No. 196,154, Oct. 10, 1980, Pat. No. 4,417,275. This application Nov. 2, 1983, Ser. No. 548,226

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ H04N *7/02, 5/06*

U.S. Cl. 358—139 **5 Claims**



1. For use with a television test pattern generator, a selectable rate sync generator system comprising: master oscillator means having a predetermined frequency; means for selecting the desired total horizontal line time comprising a binary coded decimal selector having manually setable inputs, an indicator showing the total horizontal line time and a binary coded decimal output; means coupled to said oscillator means and to said selecting means for counting the cycles provided by said master oscillator means and comparing the cycle count with the binary coded decimal output of said means for selecting to generate a train of clock pulses having x times the repetition rate (xH) of the line time selected; means for generating H rate blanking and drive pulses of predetermined duration in response to said clock means; second means for selecting the desired number of horizontal scanning lines in x fields comprising a binary coded decimal selector having manually settable inputs, an indicator showing the number of horizontal scanning lines in x fields, and a binary coded decimal output; means coupled to said clock pulses generating means and to said second selecting means for counting said train of clock pulses and comparing the clock pulse count with the binary coded output of said second selecting means to generate vertical trigger pulses having the repetition rate (V) of the number of lines selected; means for generating V rate blanking and drive pulses of predetermined duration in response to said V trigger pulses; means for summing said H and V rate blanking pulses to provide a composite blanking signal; means for generating H rate sync pulses of predetermined duration in response to said clock pulses and delayed therefrom by a predetermined interval; means for generating V rate sync pulse having a predetermined duration in response to said V rate blanking pulses, and means for summing said H and V rate sync pulses to provide a composite sync signal.

4,518,996

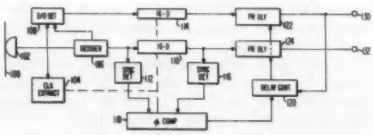
SYNCHRONIZATION SYSTEM THAT USES ALL VALID SIGNALS

Glenn A. Reitmeier, Trenton, and Charles R. Thompson, Moorestown, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1983, Ser. No. 477,492

Int. Cl.³ H04N *5/04*

U.S. Cl. 358—148 **10 Claims**



2. Apparatus for recovering valid information from an information signal having periodic synchronization signals and subject to loss of signal, said apparatus comprising comparing means for comparing successive synchronization signals to produce an error signal representing the timing difference between expected and actual synchronization signals, delaying means for delaying said information signal, and changing means for changing said delay during the loss of signal in accordance with said error signal so that said information signal following loss of signal is synchronized with the information signal preceding loss of signal.

4,518,997

DEMODULATOR HAVING TWO PHASE SHIFT NETWORKS FOR WIDE BAND TELEVISION AUDIO

Orval E. Beckman, Wheaton, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

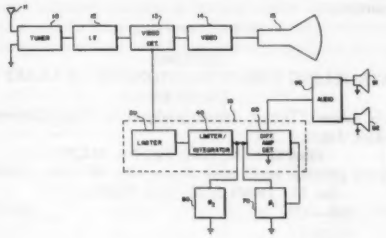
Filed Jan. 13, 1983, Ser. No. 457,604

Int. Cl.³ H04N *5/60, 7/04*

U.S. Cl. 358—198 **10 Claims**

1. In a television receiver of the type having an integrated circuit audio system including a limiter/integrator, a differential amplifier detector, and a single phase shift network coupled across inputs of the detector for producing a detected output from an input of angle-modulated waves, the phase shift network being effective for producing signals that are substan-

tially 180 degrees out of phase with respect to the inputs of the detector, the improvement comprising:



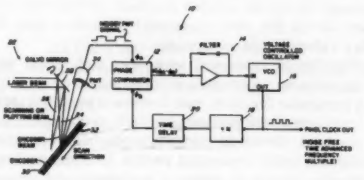
means coupled directly across the output of said limiter/integrator and ground for linearizing the response of said system.

4,518,998

METHOD AND APPARATUS FOR PRODUCING A TIME ADVANCED OUTPUT PULSE TRAIN FROM AN INPUT PULSE TRAIN

Andrew Warner, Harvard, Mass., assignor to Klimsch/Optronics, Inc., Chelmsford, Mass.

Filed Jun. 3, 1982, Ser. No. 384,476
Int. Cl.³ H03L *7/08*; H04N *3/08*
U.S. Cl. 358—208 **9 Claims**



1. A method for producing a time advanced output pulse train from an input pulse train comprising the steps of:

(1) generating an input pulse train;

(2) generating a feedback pulse train;

(3) time delaying said feedback pulse train;

(4) comparing the phase of said input pulse train with the phase of said time delayed feedback pulse train;

(5) generating a control signal that is a function of the phase difference between said input and time delayed feedback pulse train; and,

(6) adjusting the phase of said feedback pulse train in response to said control signal whereby said feedback pulse train constitutes a time advanced output pulse train with respect to said input pulse train.

4,518,999

PICTURE IMAGE POSITION SETTING APPARATUS

Masami Kurata; Hiroyuki Saitoh, and Masakane Matsuda, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

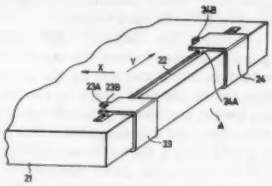
Filed Mar. 7, 1983, Ser. No. 472,824
Claims priority, application Japan, Mar. 11, 1982, 57-37289
Int. Cl.³ H04N *1/04*
U.S. Cl. 358—285 **9 Claims**

1. A picture image position setting apparatus comprising: a platen supporting a document;

linear reading means for obtaining picture information by scanning an original document line by line;

a position designating cursor attached to said platen for sliding movement in a main scanning direction to designate an end portion of a document scanning region on the platen;

said cursor being adapted to be sensed by said linear reading means; and



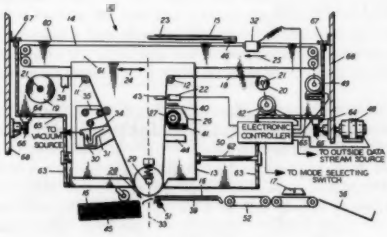
circuit means for converting picture image information with respect to the position designating cursor into positional information in the main scanning direction.

4,519,000

MAGNETOGRAPHIC CARRIAGE PRINTER

Thomas M. Frey, Webster, and Larry A. Kovnat, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1983, Ser. No. 553,926
Int. Cl.³ H04N *1/28*
U.S. Cl. 358—301 **12 Claims**



1. A magnetographic carriage printer for reproducing documents placed on a fixed platen thereof when a reproduction mode of the printer is activated, comprising:

means for scanning segments of a document placed on the fixed platen, the scanning means moving from a start-of-scan position across the document in a scanning direction to an end-of-scan position and returning to the start-of-scan position, said scanning means being adapted to scan uniformly wide segments of the document and to convert the scanned segments into digital image data signals;

means for moving the scanning means in a direction transverse to said scanning direction upon each return of the scanning means to the start-of-scan position during the reproduction mode, the moving means relocating the scanning means for a distance equal to the width of one segment so that segments of said document are sequentially scanned until the entire document has been scanned;

a magnetic tape having a magnetizable surface for recording latent magnetic images thereon, the width of the magnetic tape being determined by the width of the segment scanned by the scanning means;

a movable carriage having mounted thereon a magnetic recording head for receiving the digital image data signals from the scanning means and for recording them on the magnetic tape as latent magnetic images, a means for developing the latent magnetic images with toner particles, a means for transferring the developed images to a copy medium, and a means for cleaning any residual toner

particles from the tape to prepare it for reuse, the magnetic tape being positioned in operative relationship with the recording head, developing means, transferring means and cleaning means;

means for interconnecting the scanning means to the carriage so that they move concurrently and in a predetermined, fixed relation to each other;

means for mounting the magnetic tape, said means for mounting being adapted to hold the tape stationary during the reproduction of a document by the printer, so that as the carriage moves the tape passes by the recording head, developing means, transferring means and cleaning means;

means for activating said scanning means at a predetermined time as it moves from a start-of-scan position to scan each segment of the document to be reproduced, so that the beginning and ends of the transferred image segments are accurately aligned on the copy medium; and

means for controlling the width of the segment scanned by said scanning means to insure that each scanned segment has the same width, so that the transferred image segments are accurately stitched together to form a high quality reproduction of the document.

4,519,001

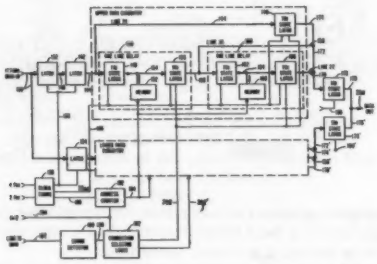
APPARATUS FOR PROVIDING DROPOUT COMPENSATION AND ERROR CONCEALMENT IN A PAL FORMAT VIDEO INFORMATION SIGNAL

Eric F. Morrison, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 27, 1981, Ser. No. 315,578

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—310 **7 Claims**



1. Apparatus for providing substitute digital data samples in a stream of digital data samples taken from an analog video information signal having a PAL television format that has been digitally sampled at four times the frequency of a color subcarrier of the video signal at instants of 45°, 135°, 225° and 315° relative to the U chrominance component of said video information signal, said digital data stream having samples corresponding to horizontal line locations of a raster display of successive horizontal lines wherein said locations of each line are vertically aligned with said locations of the other lines, said apparatus comprising:

means for receiving data word samples from at least three successive horizontal video lines and for storing said video data samples from at least two of said horizontal video lines;

means for detecting a missing or defective sample in one of said video lines and for generating an indicating signal when a missing or defective sample is detected;

means, responsive to said indicating signal and operatively coupled to said receiving and storing means and to said detecting means, for inserting a substitute data sample into said one video line for said missing or defective data sample, said substitute data sample being selected from one of the samples of one of the preceding or succeeding horizontal lines relative to said one video line, said substitute data sample selected being vertically aligned and correspondingly phased relative to said missing or defective sample.

4,519,002

CONTROLLING THE OPERATIONS OF AT LEAST TWO DEVICES

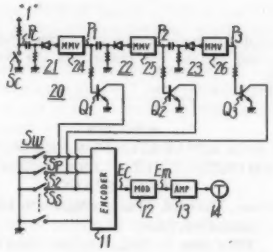
Toshio Amano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,346

Claims priority, application Japan, Oct. 30, 1980, 55-152739

Int. Cl.³ H04N *5/76, 5/64;* H04M *11/10*

U.S. Cl. 358—335 **16 Claims**



1. Remote control apparatus for generating and transmitting command signals to a video playback device and to a video display device for controlling said devices to play back and display video signals, comprising:

a plurality of command switches, each being selectively operable to command a predetermined device to perform a particular function, said command switches including at least a playback command switch to command said video playback device to perform a playback operation and a channel select command switch to command said video display device to select a predetermined channel over which played back video signals are displayed, encoder means having plural inputs coupled to respective ones of said command switches and responsive to the selective operation of a command switch to generate an encoded representation of the function commanded by the operated switch, transmitting means coupled to said encoder means for transmitting said encoded representation to said video playback and display devices, selectively operable control switch means, and control means coupled to said encoder means and responsive to the operation of said control switch means to cause said encoder means to generate successive encoded representations of at least the functions commanded by said playback and channel select command switches.

4,519,003

VIDEO RECORDER INCLUDING A PLURALITY OF OPERATING ELEMENTS

Gerhard Scholz, Vienenburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,447

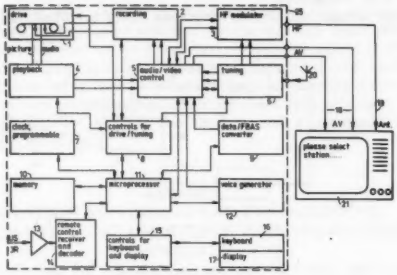
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104843

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—335 **14 Claims**

1. In a video recorder system including a video recorder having an output means, a plurality of functional means including a video storage means connected to the output means for recording video signals and for playing back such signals via the output means, and a plurality of operating elements which

can be operated by an operator according to a desired mode of operation as outlined in operating instructions for controlling the functional means, the improvement wherein said video recorder includes instruction storage means coupled to said output means for storing video and audio representations of the operating instructions and for selectively applying the repre-



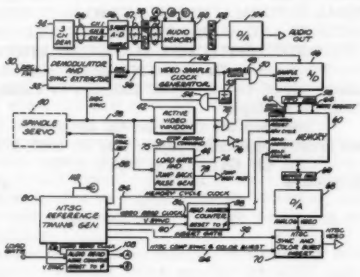
sentations to said output means during operation of the video recorder, and said system further includes a television playback device connected to said output means for receiving and utilizing the representations, in addition to the video signals, for establishing a dialog between the operator and said video recorder for the purpose of operating, programming and monitoring said recorder.

4,519,004

EXTENDED PLAY VIDEODISC

Richard L. Wilkinson, El Toro, and Gary M. Giddings, Laguna Hills, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Jun. 1, 1982, Ser. No. 384,140
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—342 **21 Claims**



1. A method of displaying video information recorded on a storage medium, comprising the steps of:

a. reading a first segment of video information from the medium during a first period of time;

b. repetitively outputting the first segment of video information during a predetermined number of consecutive second periods of time, each of said second periods of time being longer than said first period of time;

c. reading a further segment of video information from the medium simultaneously with a portion of the last of the predetermined number of second periods of time during which the first segment of video is being outputted; and

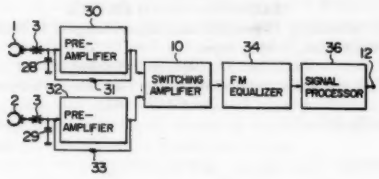
d. functionally repeating steps b and c for each video information segment read.

4,519,005

MAGNETIC TAPE REPRODUCING APPARATUS

Akira Shibata; Koichi Hirose, and Akihiro Yamamoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 248,534, Mar. 27, 1981. This application Sep. 16, 1983, Ser. No. 532,896
Claims priority, application Japan, Mar. 28, 1980, 55-38934
Int. Cl.³ G11B *5/45, 15/02*
U.S. Cl. 360—65 **7 Claims**



1. A magnetic tape reproducing apparatus comprising:

first, second, third and fourth playback heads;

first and second playback mode switches each having first and second positions;

first and second damping circuit means, the first damping circuit means being selectively connectable to said first and third playback heads by the positioning of said first playback mode switch, the second damping circuit means being selectively connectable to said second and fourth playback heads by the positioning of said second playback mode switch, the first and second playback heads operating during a first tape feeding speed in the first playback mode and the third and fourth playback heads operating during a second tape feeding speed in the second playback mode;

said first and second playback heads in said first playback mode being connected via said first and second playback mode switches to said first and second damping circuit means respectively while in said second playback mode said third and fourth playback heads being connected via said first and second playback mode switches to said first and second damping circuit means respectively;

each damping circuit means damping the output from the playback head to which it is connected so that the peaking characteristic is substantially flat as a function of frequency in the frequency band of the recorded signal, the peaking characteristic being determined by its equivalent capacitance, its equivalent damping resistance, the inductance of the playback head to which it is connected, and the capacitance, the peaking characteristic not governing a total reproduction equalizing characteristic, each of the damping circuit means including a preamplifier having an input and an output between which is coupled a feedback resistance;

said playback heads each have substantially equal inductance and the equivalent resonant capacitance and equivalent damping resistance of the first and second damping means are equal;

a switching circuit for sequentially passing the output signals from said first and second damping circuits in turn, the outputs of the preamplifiers being coupled to said switching circuit;

reproduction equalizer means for creating substantially the total reproduction equalizing characteristic for the output signal from the switching circuit;

a signal processor for converting the output signal from the reproduction equalizer circuit, to a recorded information signal; and

wherein each of said damping circuit means includes an emitter grounded amplifier having a first transistor, the base of which is supplied with an output signal from the associated video head, a base grounded amplifier having a

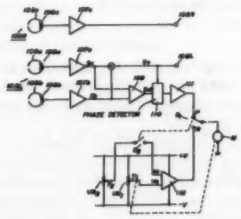
second transistor, the emitter thereof is connected to the collector of said first transistor, and a resistor connected between the base of said first transistor and an output terminal connected to the collector of said second transistor through an emitter follower to thereby apply the collector output signal of said second transistor to the base of said first transistor together with a D.C. bias current through said emitter follower and said resistor.

4,519,006

MAGNETIC HEAD DEVICE

Niro Nakamichi, Higashikurume, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,450
Claims priority, application Japan, Dec. 14, 1981, 56-201420
Int. Cl.³ G11B *5/43*
U.S. Cl. 360—76 **4 Claims**



1. A magnetic head device for a magnetic recording and reproducing apparatus comprising:

magnetic head means having a reproducing gap to separately scan an upper portion and a lower portion of a single signal track on a magnetic tape and providing two reproduced signals from the single track on which an identical signal is recorded;

means for determining a difference in phase between said two reproduced signals in a playback mode;

means for adjusting the azimuth position of said gap of said magnetic head means relative to the signal recorded on the track in response to a phase difference between said two reproduced signals in a playback mode;

means for returning said azimuth position of said gap of said magnetic head means to a predetermined reference azimuth position;

and means for selecting operation of said adjusting means in response to said playback mode and selecting operation of said returning means in response to a record mode whereby said azimuth position of said gap is adjusted relative to said signal recorded on the track in said playback mode and is returned to said reference azimuth position in said record mode.

4,519,007

SERVO-TRACK POSITION DETECTION SYSTEMS

Graham P. Sellars, Winsford, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 8, 1982, Ser. No. 447,834
Int. Cl.³ G11B *5/58*
U.S. Cl. 360—77 **20 Claims**

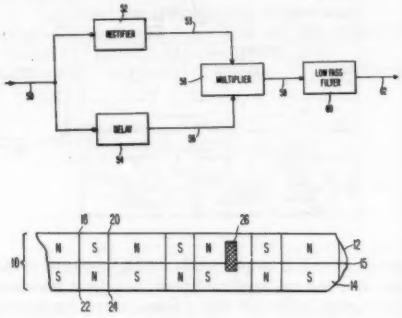
1. A system for indicating the position of a transducer relative to a servo track on a moving medium by measurement of the difference between first and second signal components recovered respectively from first and second sub-tracks of said servo track simultaneously accessed by said transducer with respective amplitudes proportional to the respective extents of interaction of said transducer with said first and second sub-tracks, said system being characterized by:

said first sub-track comprising a first component for inducing a first response of a first polarity in said transducer and a second component for inducing a second response of a second polarity in said transducer,

said second sub-track comprising a third component for inducing a third response of said second polarity in said transducer and a fourth component for inducing a fourth response of said first polarity in said transducer,

said first and third responses being simultaneously induced in said transducer,

said second and fourth responses being simultaneously induced in said transducer to provide a residual response resulting from the cancellation in whole or in part of said second and fourth responses, and



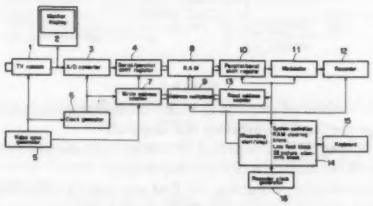
said system comprising a decoder coupled to receive the output of said transducer and operable to respond to the receipt of said first and/or said third responses to sample said residual response, said residual response being indicative by polarity and magnitude of the direction and distance of displacement of said transducer from equal interaction with each of said sub-tracks.

4,519,008

METHOD OF RECORDING AND REPRODUCING VISUAL INFORMATION IN AUDIO RECORDING MEDIUM AND AUDIO RECORDING MEDIUM RECORDED WITH VISUAL INFORMATION

Tsutomu Takenouchi; Tsunehiko Nagasawa, and Masatada Nanasawa, all of Tokyo, Japan, assignors to Toshiba-EMI Limited, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,671
Claims priority, application Japan, May 31, 1982, 57-92618
Int. Cl.³ G11B *31/00*; H04N *5/782*
U.S. Cl. 360—79 **4 Claims**



1. A method of recording visual information in an audio recording medium and reproducing the same comprising the steps of:

quantizing a signal from a television camera photographing letters and characters by means of clock pulses having a certain frequency to produce two kinds of pulse signals;

modulating said two kinds of pulse signals into two kinds of sine waves each having a specific audio frequency band;

adding blank portions to said two kinds of sine waves at predetermined intervals to form a character signal, said blank portions having time durations of their own respectively;

recording said character signal on an audio recording medium;

picking up said character signal from said recording medium; and

processing said picked-up character signal by separate means according to said sine waves and said blank portions, said sine waves being reproduced on a screen in the form of photographed letters and characters, said blank portions being used as command signals including a command for starting reproduction on the screen of words, a command for vertical line feeding, and a command to clear the screen.

4,519,009

DICTATION RECORDING AND TRANSCRIBING SYSTEM UTILIZING A MULTIPLE MEDIA CARTRIDGE APPARATUS

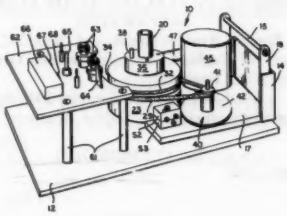
Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Division of Ser. No. 137,802, Apr. 7, 1980, , which is a division of Ser. No. 970,357, Dec. 18, 1978, Pat. No. 4,247,876. This application Jul. 20, 1982, Ser. No. 400,124

The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.

Int. Cl.³ G11B *15/68*

U.S. Cl. 360—92 **1 Claim**



1. In a dictation recording system, a cartridge means for carrying a first recording medium and a second recording medium, said cartridge means having an aperture about the center of which said first recording medium and said second recording medium are symmetrically positioned; and

a cartridge positioning means for selectively positioning said cartridge means to place either said first recording medium or said second recording medium in a recording position relative to a transducer for recording thereon with said transducer, said cartridge positioning means comprising:

a cylindrical drive member mounted on a frame for rotation about an axis, said drive member including engaging means insertable into said aperture for engaging said cartridge means with the center of said aperture along said axis so that said cartridge is supported and positioned relative to said frame entirely by said drive member and so that rotation of said drive member about said axis rotates said cartridge means about said axis with said first recording medium and said second recording medium symmetrically positioned about said axis, said drive member having a lower position relative to said frame in which said drive member in a first rotational position about said axis positions said cartridge means to place said first recording medium in said recording position relative to said transducer and in which said drive member in a second rotational position about said axis positions said cartridge means to place said second recording medium in said recording position relative to said transducer, and said drive member having an upper position relative to said frame in which said drive member in all rotational positions about said axis positions said cartridge means to place said first recording medium and said second recording medium in a plane of rotation of said cartridge means about said axis with said drive member which is above said transducer;

cam means mounted on said frame for moving said drive member between said lower position and said upper position in response to selective motion of a cam surface; and

driving means selectively operative first to move said cam surface to cause said drive member to move from said lower position to said upper position, then to rotate said drive member about said axis from said first rotational position to said second rotational position, and then to move said cam surface to cause said drive member to move from said upper position to said lower position and thereby place said second recording medium in said recording position relative to said transducer;

brake means for preventing rotation of said drive member when said drive member is in said lower position; and

means for releasing said brake means to allow said drive member to rotate when said drive member is in said upper position.

4,519,010

DRIVING MECHANISM FOR MAGNETIC HARD DISC MEMORIES

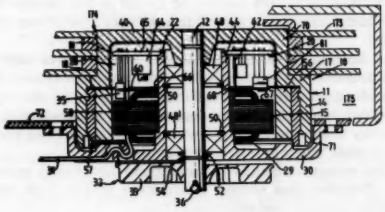
Dieter Elsaesser, St. Georgen; Johann von der Heide, Moenchweiler; Rolf Müller, and Georg Papst, both of St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St Georgen, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,559

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045972

Int. Cl.³ G11B *5/12*

U.S. Cl. 360—97 **25 Claims**



1. A driving mechanism for magnetic hard disc memory having a read/write head, comprising:

means in said mechanism isolating an enclosed space for maximum cleanness;

a brushless direct current driving motor mounted within said driving mechanism and having a stator, including a stator lamination, and a rotor, said rotor being a permanent magnet outer rotor having a bell-shaped rotor casing and at least one permanent magnet fixed in the rotor casing, said motor when energized having parts producing magnetic flux;

a rotor shaft mounting said rotor, said shaft being mounted by bearing means in said driving mechanism;

a hub extending into the isolated enclosed space of maximum cleanness for receiving therein at least one magnetic hard memory disc having magnetic tracks with which the read/write head aligns in a reciprocal alignment relationship;

means connecting said motor and said hub for driving said hub;

means forming a magnetic flux shield and located between

the parts producing the magnetic flux and the isolated enclosed space of maximum cleanness; and

means detachably connecting the rotor to the rotor shaft independently of said means connecting said motor and said hub, whereby said rotor is removable from said rotor shaft without affecting the reciprocal alignment between the read/write head and the magnetic tracks of the hard memory disc.

4,519,011

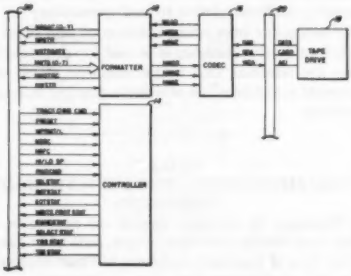
POWER CONTROL CIRCUIT

Edgar A. Bowden, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,175

Int. Cl.³ G11B *5/00, 31/00*

U.S. Cl. 360—137 **6 Claims**



4. A power control circuit for use with a seismic data multi track tape recorder system and a power supply in an ocean bottom seismometer comprising:

very low power circuits for retaining information consisting of tape movement direction and track number,

first distribution means connected to the power supply for providing continuous power to said very low power circuits,

second distribution means connected to the power supply and to additional portions of the tape recorder system for providing power to said additional portions of the tape recorder system said second distribution means having a standby state wherein no power is provided and an energized state wherein power is provided, and

selective means connected to said second distribution means for changing said second distribution means from said standby state to said energized state.

4,519,012

LIQUID QUANTITY SENSOR OF CAPACITOR TYPE AND METHOD OF PRODUCING SAME

Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 8, 1983, Ser. No. 521,171

Claims priority, application Japan, Sep. 10, 1982, 57-157861

Int. Cl.³ H01G *5/28;* **G01F** *23/00*

U.S. Cl. 361—284 **23 Claims**

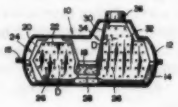
1. A sensor for detecting the quantity of a liquid in a vessel, the sensor comprising at least one set of electrode plate assembly which comprises:

a first electrode plate substantially vertically disposed in the vessel;

a second electrode plate arranged parallel to and spaced from said first electrode plate such that said first and second electrode plates provide a capacitor;

a plurality of spacers having a generally annular shape and made of electrically insulating synthetic resin material, said spacers being tightly and substantially interposed between said first and second electrode plates in such an arrangement that the distance between each adjacent pair of said spacers is between 50 and 80 mm, each of said spacers having a thickness which corresponds with a predetermined horizontal distance between said first and second electrode plates;

a plurality of fastening means for fastening said second electrode plate to said first electrode plate, said fastening means extending through holes formed in said first and



second electrode plates at each location where one of said spacers is interposed between said first and second electrode plates, each of said spacers being subjected to a compressive load between 40 and 100 kgf; and

a plurality of insulator collars, each having the shape of a flaged tube, the tubular portion of each of said indulators being inserted in the central hole of one of said spacers interposed between said first and second electrode plates.

4,519,013

ASSEMBLIES OF ELECTRICAL OR ELECTRONIC APPARATUS

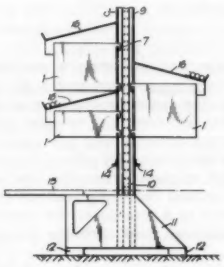
Gerald D. Breeze, West Midlands, and Donald C. Elliott, Warwick, both of England, assignors to The General Electric Company, p.l.c., England

Filed Jun. 2, 1982, Ser. No. 384,336

Claims priority, application United Kingdom, Jun. 9, 1981, 8117626

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—384 **7 Claims**

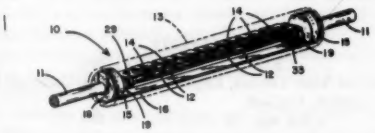


2. An assembly of electrical or electronic apparatus comprising at least two substantially vertical column members, a pair of vertical planar support members supported on and separated by said vertical column members, each of said support members having therein over at least a part of its area an array of apertures, at least one unit of electrical or electronic apparatus, means extending from said one unit into at least one of said apertures to attach said one unit to one of said support members, a planar deflector member, means to attach said deflector member above said one unit at an angle to said one support member so as to channel air rising from said one unit through at least some of said apertures in said one support member, and said support members and an adjacent pair of said vertical column members defining a vertical path for the passage of air so channelled from said one unit of the apparatus for the cooling of said apparatus in operation.

4,519,014
CABLE ACCESS ASSEMBLY

Daniel G. Skovran, Minnetonka; Brett A. Shockley, Edina, and Harvey J. Chouanard, Deephaven, all of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed May 9, 1983, Ser. No. 492,944
Int. Cl.³ H05K 7/02
U.S. Cl. 361—397 24 Claims

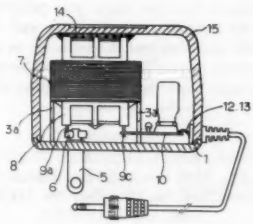


2. A multi-conductor cable access assembly comprising:
a pair of end elements each having an opening through which a multi-conductor cable extends, said end elements being spaced apart along said multi-conductor cable;
an elongated strain relief bar extending between said spaced apart end elements;
means for connecting said strain relief bar with each of said end elements to prevent relative rotational and longitudinal movement between each of said end elements and said strain relief bar, said means including a pair of spaced apart yoke members at each end of said strain relief bar, said yoke members in each of said pairs of yoke members straddling a corresponding one of said end elements; and
a tubular member enclosing said end members and said strain relief bar.

4,519,015
PLUG-IN TYPE OF POWER SUPPLY

Jing S. Lin, 15, Lane 62, Tsai Kung I Rd., Tsoying, Kaohsiung, R.O.C., Taiwan

Filed Aug. 23, 1983, Ser. No. 525,766
Int. Cl.³ H05K 5/06
U.S. Cl. 361—399 3 Claims

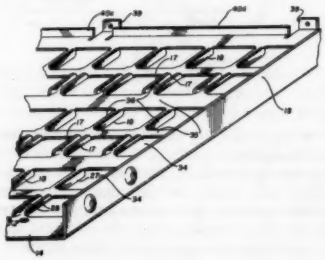


1. A plug-in type of power supply comprising
a casing including a bottom lid and an upper lid in sealing connection therewith,
said bottom lid having openings therethrough,
support means mounted on said bottom lid,
a transformer coil section and a circuit board both mounted on said support means,
said transformer coil section having shaft members extending therethrough,
said shaft members having input plug prongs and output insertion prongs mounted on and electrically connected to said shaft members,
power plug prongs extending through said openings in said bottom lid,
conductive metal joint pieces engaged on said power plug prongs,
said input plug prongs extending into said joint pieces,
said circuit board having holes therethrough to receive said output insertion prongs therein for rigid connection of said transformer coil section with said circuit board,
output means connected from said circuit board through said casing,
said transformer coil section and said circuit board in rigid connection to each other and to said upper and bottom lids.

4,519,016
PRINTED CIRCUIT BOARD CARD CAGE

James D. Bradley, Mound, and Gregg B. Amundson, Bloomington, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Sep. 29, 1983, Ser. No. 537,336
Int. Cl.³ H05K 7/18
U.S. Cl. 361—415 10 Claims



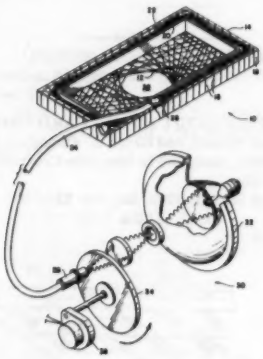
1. A dual density printed circuit board card cage comprising:
an upper frame member having a plurality of spaced guide means for engaging an edge of a printed circuit board card and guiding the same into an operable position within said card cage;
a lower frame member having a plurality of spaced guide means for engaging an edge of a printed circuit board card and guiding the same into an operable position within said card cage; and
an intermediate frame member having front, back and a pair of side edges, an upper and a lower surface and being spaced in parallel relationship between said upper and lower frame members, said intermediate frame member comprising a generally flat sheet of metal having a plurality of openings separated from each other by a plurality of web portions and a plurality of spaced, guide means on both its upper and lower surfaces for engaging an edge of a printed circuit board card and guiding the same into an operable position with said card cage, each of said guide means on the upper surface of said intermediate frame member being aligned and adapted for cooperation with a corresponding guide means of said upper frame member and each of said guide means on the lower surface of said intermediate frame member being aligned and adapted for cooperation with a corresponding guide means of said lower frame member, the plurality of guide means on the upper and lower surfaces of said intermediate frame member further being arranged in opposing pairs of guide means which are aligned with one another but which face in opposite directions, each of said opposing pairs of guide means being formed by a plurality of guide sections comprised of at least one pair of guide edges extending generally toward said upper frame member and at least one pair of guide edges extending generally toward said lower frame member.

4,519,017

LIGHT EMITTING OPTICAL FIBER ASSEMBLIES AND METHOD FOR FORMING THE SAME

Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012

Filed Sep. 29, 1982, Ser. No. 427,155
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 27 Claims



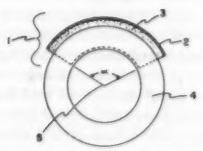
1. A light emitting panel assembly comprising supporting frame means having a front face and a rear face, a plurality of elongated light emitting fiber means mounted upon said supporting frame means and extending on the front face thereof, said light emitting fiber means being of the type which leak light traveling therethrough when said light emitting fibers are bent, and being mounted on said frame means in a manner such that there are no bends in those light emitting fiber means large enough to cause an undesirably high percentage of light to leak from said light emitting fiber means, said light emitting fiber means being operative to emit light along the length thereof, at least one of the ends of each of said plurality of elongated light emitting fiber means being bundled together with the ends of other light emitting fiber means to form a unitary bundle, said unitary bundle being positioned adjacent the rear face of said supporting frame means.

4,519,018

CAR DOME LIGHT WITH ACCESSORY

David B. Rowland, 8713 Langtree La., Raleigh, N.C. 27612

Filed Apr. 2, 1984, Ser. No. 596,241
Int. Cl.³ B60Q 3/02
U.S. Cl. 362—74 1 Claim



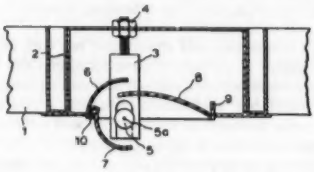
1. A removable automobile dome light accessory consisting essentially of a shape-sustaining material surface extending in a substantially vertical plane continuously around a dome light central axis substantially parallel to said plane so as to block out light emanating therefrom into the passenger area of an automobile, the outermost edges of said shape-sustaining material surface forming an angle of between 90 degrees and 180 degrees with said axis, and said surface having flange portions connected thereto and extending inwardly from the uppermost edges of said surface toward the said central axis, said flange portion slidably engaging the dome light of the automobile, wherein said surface extends downwardly in a substantially vertical plane from the upper edge of said surface a distance of at least approximately two inches, wherein said flange portions extend inwardly a sufficient distance to slide under a portion of the outer edge of a fixed automobile dome light, whereby said accessory is readily attachable to and removable from said automobile dome light, and is selectively adjustable to illuminate one passenger area while blocking light that would be generated towards other passenger areas of the automobile.

4,519,019

CEILING LIGHT FITTING

Stephen M. Hall, London, England, assignor to Quantum Lighting Limited, England

Filed Apr. 20, 1984, Ser. No. 602,492
Claims priority, application United Kingdom, Apr. 22, 1983, 8311075
Int. Cl.³ F21S 1/02
U.S. Cl. 362—147 12 Claims



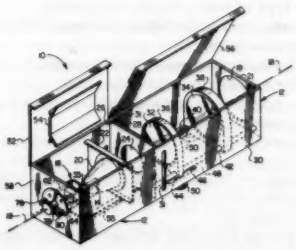
1. A ceiling light fitting for lighting a wall, comprising:
means for mounting the fitting in the ceiling;
holding means for holding a lamp in the fitting with its light source roughly at ceiling level;
an extended reflector for extending substantially parallel to the wall, the shape of the reflector surface as seen in section at right angles to the wall being substantially constant wherever the section is taken along the length of the reflector, the reflector facing generally downwards and having at least its major part positioned above the level of the light source and on the wall side of the light source, the said shape of the reflector as seen in the said section being generally concave and arranged to direct reflected light towards the base portion of the wall.

4,519,020

VARIABLE MAGNIFICATION STAGE LIGHT

William D. Little, 3548 Townsend Dr., Dallas, Tex. 75229

Filed Nov. 14, 1983, Ser. No. 551,031
Int. Cl.³ F21V 7/00
U.S. Cl. 362—268 8 Claims



1. An optical projection system for projecting light onto an object in which the area of projected illumination is selectively variable comprising, in combination:

a projector housing having an open end through which light may be projected along an optical axis;

an open ended reflector received within said housing and aligned generally with said optical axis, said reflector having a lip radius R_R;

a lamp disposed within said reflector;

first and second lenses spaced apart on said optical axis through which light from said light source successively passes and is projected out said open end, said first lens having a radius R_1 and a focal length f_1, and said second lens having a radius R_2 and a focal length f_2;

a gate having a gate aperture interposed between said reflector and said first lens at an axial distance L_g from said reflector; and,

the diameter of said reflector and its axial spacing with respect to the gate aperture, together with the diameter and focal length of said lenses being selected whereby the following ratio is established:

$$B_1/B_R = B_2/B_1 = k$$

where:
B_R = arc tan (R_R/L_g);
B_1 = arc tan (R_1/f_1);
B_2 = arc tan (R_2/f_2); and,
k = constant.

4,519,021

OPERATING THEATRE TABLE LIGHT

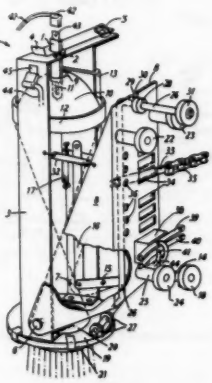
John A. Oram, 243 Heath Rd., Leighton Buzzard, Bedfordshire, England

Division of Ser. No. 488,879, Apr. 26, 1983,. This application Jul. 24, 1984, Ser. No. 633,997

Claims priority, application European Pat. Off., Apr. 28, 1982, 82 302194.4

Int. Cl.³ F21V *9/00*

U.S. Cl. 362—277 **10 Claims**



1. A lamp unit comprising a mounting for a light source, a member defining an aperture, and a reflector positioned to reflect light from a light source mounted in said mounting, to generate a beam which is directed towards said aperture and converges at a point between said reflector and said aperture, said mounting and said reflector being movable one with respect to the other to move the point of convergence toward and away from said aperture.

4,519,022

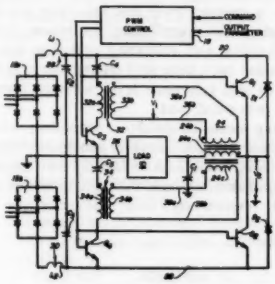
RIPPLE REDUCTION CIRCUIT FOR AN INVERTER

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 22, 1983, Ser. No. 554,250

Int. Cl.³ H02M *1/14*

U.S. Cl. 363—41 **9 Claims**



1. In an inverter for converting DC power supplied on a pair of buses into AC power to drive a load, the inverter having a power switch coupled between a bus and the load with the load being in turn coupled to the other bus, the power switch being operated to develop the AC power, an improved ripple reduction circuit for reducing ripple in the AC power caused by ripple on the buses, comprising:

a sensing transformer coupled between the buses having a primary winding which senses the ripple on the bus and a secondary winding which develops a periodic waveform in response to the sensed ripple; and

an output inductor having a secondary winding coupled to the sensing transformer secondary winding and a primary winding coupled between the power switch and the load, the primary winding receiving a first ripple component due to ripple in the bus, the periodic waveform in the output inductor secondary winding inducing a second ripple component in the output inductor primary winding which opposes the first ripple component to reduce ripple delivered to the load.

4,519,023

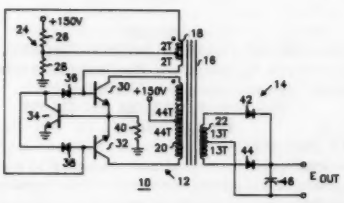
SELF-OSCILLATING INVERTER INCLUDING A DC TO DC CONVERTER AND METHOD FOR CONTROL THEREOF

Theodore V. Lester, Schiller Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 20, 1983, Ser. No. 496,378

Int. Cl.³ H02H *7/122*; H02M *3/335*

U.S. Cl. 363—56 **19 Claims**



1. A control circuit for a one-transformer DC to AC inverter comprising:

first and second switching means for alternately switching a current through a primary winding of said transformer

connected to like first electrodes of said first and second switching means;

means connected to common connected second electrodes of said first and second switching means for sensing a level of said current therethrough;

means coupled to respective third electrodes of said first and second switching means for comparing said sensed current level to a reference level, said reference level corresponding to a current level just less than the primary current required for transformer saturation, and alternately deactivating and activating said first and second switching means each time said current level is substantially equal to said reference level wherein transformer saturation is prevented; and

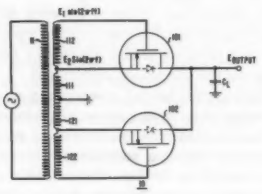
inductive loading means coupled to a secondary winding of said transformer for providing a generally linear ramp shaped increasing waveform to said current through said first and second switch means throughout the conduction time thereof, respectively, until said reference level is reached.

4,519,024

TWO-TERMINAL TRANSISTOR RECTIFIER CIRCUIT ARRANGEMENT

Joseph Federico, Berkeley Heights, and Sigurd G. Waaben, Princeton, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 2, 1983, Ser. No. 528,899
Int. Cl.³ H02N *7/217*
U.S. Cl. 363—127 **16 Claims**



1. A rectifier comprising:

(a) a power transistor device having a first high current carrying terminal serving as a rectifier output terminal and a second high current carrying terminal serving as a rectifier input terminal, and having a low current carrying control terminal for turning the transistor on and off; and

(b) comparator feedback means having first and second feedback input terminals connected to the rectifier input and output terminals, respectively, and having a feedback output terminal connected to the control terminal of the power transistor for supplying feedback to the control terminal device whereby the power transistor turns on when the voltage at the input terminal exceeds the voltage at the output terminal less a prescribed amount.

4,519,025

SENSE POINT MONITOR CIRCUIT

Brad K. Fayette, St. Petersburg, Fla., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Filed Nov. 8, 1982, Ser. No. 439,955
Int. Cl.³ H03K *13/32*
U.S. Cl. 364—141 **5 Claims**

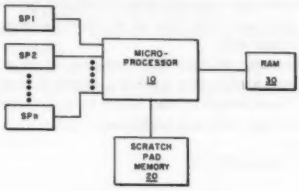
1. A sense point monitor circuit connected to a plurality of sense points each operated to provide a status signal of a first or second characteristic, said sense point monitor circuit comprising:

storage means having a plurality of first, second and third storage locations;

scanning means connected to said sense points and said storage means and operated to periodically scan each sense point and store the status signal of each scanned sense point in an associated first storage location;

processing means connected to said storage means and operated to transfer the contents of said first storage location to an associated second storage location prior to each subsequent scan of said associated sense point;

said processing means being further operated in response to a signal of said first characteristic from said associated first and second storage locations to store a resultant signal of a first characteristic in an associated third storage location;



said processing means being further operated in response to a signal of said first characteristic from said associated first and third or second and third storage locations to store said resultant signal of a first characteristic in said associated third storage location; and

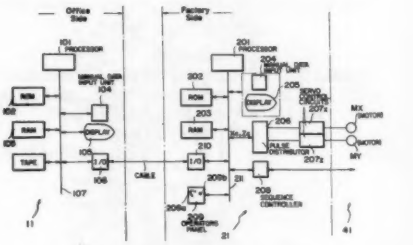
said processing means being further operated in response to a signal of said second characteristic from said associated first and second or first and third or second and third storage locations to store a resultant signal of a second characteristic in said associated third storage location.

4,519,026

NUMERICAL CONTROL SYSTEM WITH GRAPHICAL DISPLAY PROCESSING OF SIZE AND SHAPE OF PART CONTOUR

Ryoichiro Nozawa, and Nobuyuki Kiya, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

Filed Jun. 21, 1982, Ser. No. 390,378
Claims priority, application Japan, Jun. 22, 1981, 56-96375
Int. Cl.³ G05B *19/42*
U.S. Cl. 364—167 **9 Claims**



1. A numerical control system for a machine tool, comprising:

a cable;

an automatic programmer; and

a numerical control device connected to the machine tool and to said automatic programmer through said cable;

said automatic programmer comprising:

an input unit for entering data required for the preparation of a numerical control program;

a first processor, operatively connected to said input unit, which edits the data entered by said input unit for preparing the numerical control program and which produces an output;

display means, operatively connected to said first processor, for displaying graphics in accordance with the output from said first processor;

first memory means, operatively connected to said first processor, for storing the prepared numerical control program; and

a first interface circuit, operatively connected to said first processor, for administering the exchange of the data with said numerical control device; and

said first processor of said automatic programmer displays, on said display means, a graphic which conforms to a contour pattern entered through said input unit, numerical data entered by said input unit being used to edit the displayed graphic, to display on said display means a graphic modified in shape on the basis of said entered numerical data, and prepares the numerical control program on the basis of said entered contour pattern and numerical data;

said numerical control device comprising:

a second interface circuit operatively connected to said first interface circuit of said automatic programmer through said cable;

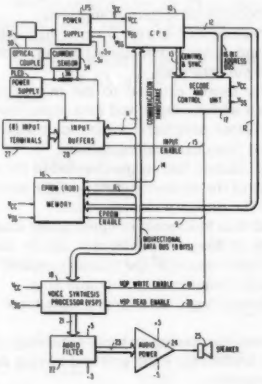
second memory means, operatively connected to said second interface circuit, for storing the numerical control program transferred from said first memory means of the automatic programmer through said first and second interface circuits and said cable; and

a second processor, operatively connected to said second memory means and the machine tool, which executes numerical control processing in accordance with the numerical control program stored in said second memory means for numerically controlling the machine tool connected to said numerical control device.

4,519,027
INDUSTRIAL CONTROL, COMMUNICATIONS AND INFORMATION SYSTEM

Walter Vogelsberg, Doylestown, Pa., assignor to Cybersonic Corporation, Montgomery, Pa.

Filed Jun. 10, 1982, Ser. No. 387,578
Int. Cl.[3] G06F *15/46*; G08B *25/02*
U.S. Cl. 364—185 **13 Claims**



5. In an industrial communication and information control system having electrical switch means for producing a plurality of electrical signals corresponding to a plurality of alarm conditions in an industrial facility, a central data processing unit for scanning said means for producing a plurality of signals, the improvement comprising,

means for sensing the presence of signals corresponding to any one of said alarm conditions, and producing an activating signal,

means coupling said activating signal to said central data processing unit for activating same,

each said switch means being connected to an optical couple having a light emitting element and a light detecting element,

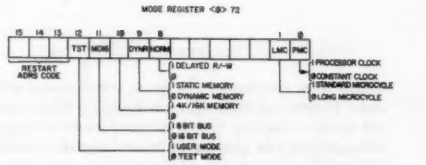
said activating signal being constituted by current flow to one of said light emitting elements, and

all of said light detecting elements being simultaneously electrically energized by a common signal from said central data processing unit.

4,519,028
CPU WITH MULTI-STAGE MODE REGISTER FOR DEFINING CPU OPERATING ENVIRONMENT INCLUDING CHARGING ITS COMMUNICATIONS PROTOCOL

Richard E. Olsen, Framingham, and Dwight C. Baker, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 17, 1981, Ser. No. 234,926
Int. Cl.[3] G06F *9/00*
U.S. Cl. 364—200 **12 Claims**



1. A central processor unit for connection in a data processing system, the central processor unit including:

A. means for performing an information transfer, including means for transmitting information signals, including address signals and data signals, to, and means for receiving data signals and interrupt request signals from, other units in the data processing system over respective information and interrupt request transfer lines;

B. an operating mode register including a first stage having a set condition and a reset condition; and

C. means connected to said first stage of said operating mode register and to said transmitting means and said receiving means for enabling the transmitting means to contemporaneously transmit data signals over the information signal transfer lines and address signals over the interrupt request signal transfer lines when said first stage is set, and for alternately transmitting address signals and data signals over the information signal transfer lines when said first stage is reset.

4,519,029
DATA COMMUNICATIONS SYSTEM WITH AUTOMATIC COMMUNICATIONS MODE

E. Earle Thompson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 18, 1981, Ser. No. 264,882
Int. Cl.[3] G06F *3/14*
U.S. Cl. 364—200 **6 Claims**

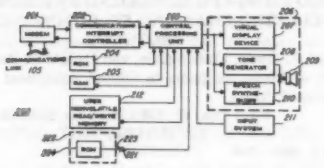
1. A data communications system comprising:

a host data processing system for performing predetermined data processing functions and for generating output signals comprising the results of said predetermined data processing functions in response to receiving data processing request signals, said performed data processing functions corresponding to said received data processing request signals;

a data transmission means for transmitting signals generated

by said host data processing system and for transmitting signals to said host data processing system; and

a remote data processing system having means for receiving output signals from said host data processing system transmitted by said data transmission means, means for generating an operator selected set of data processing request signals having an operator selected order, memory means for storing said set of data processing request signals, means for generating a time interval signal corresponding to an operator selected time interval and storing said time interval signal in said memory means, a memory access means for recalling said set of data processing request



signals from said memory means in said operator selected order in response to an operator initiation signal and output means connected to said memory means for applying said recalled data processing request signals to said data transmission means for transmission to said host data processing system, said memory access means further comprising means for recalling said time interval signal in an operator selected position in said operator selected order of said set of data processing request signals and means for causing a delay in said recall of the next sequential data processing request signal upon recall of a time interval signal, said delay equal to said operator selected time interval.

4,519,030

UNIQUE MEMORY FOR USE IN A DIGITAL DATA SYSTEM

Brett L. Bachman, Boston; Ward Baxter, II, Carlisle, both of Mass.; Ronald H. Gruner; David L. Houseman, both of Cary, N.C.; Thomas M. Jones, Chapel Hill, N.C.; Stephen R. Redfield, San Jose, Calif.; Louis E. Drew, Princeton, and Michael B. Druke, Chelmsford, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,420

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **3 Claims**

1. A memory system for use with a digital data system, said memory system comprising:

memory I/O means connected from a first portion and from a second portion of said digital data system for interfacing between said digital data system and the remainder of said memory system;

said remainder of said memory system including:

(a) memory bank means for storing said data; and

(b) memory control means adapted to receive first addresses from said memory I/O means and adapted to provide second addresses to both said I/O means and said memory bank means, for controlling operation of said memory bank means;

said memory I/O means having first port means, second port means and third port means;

first bus means connected between said first portion and said first port means for conducting first certain of said first addresses and first certain of said data therebetween;

second bus means connected between said second portion and both said second port means and said third port means for conducting second certain of said first addresses therebetween, and for conducting third certain of said first addresses therebetween;

third bus means connected between said second portion and both said second port means and said third port means for conducting second certain of said data therebetween, and for conducting third certain of said data therebetween;

fourth bus means connected between said second portion and said second port means for conducting fourth certain of said data therebetween; and,

formatting means responsive to operation of said memory control means for performing format manipulation operations upon said second certain of said data, and upon third certain of said data.

4,519,031

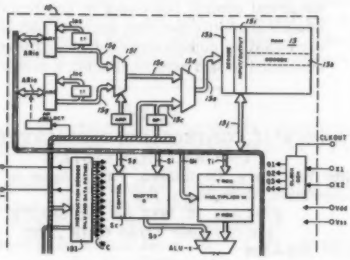
MICROCOMPUTER WITH ACCUMULATOR SATURATION UPON OVERFLOW

Surendar Magar, and Wanda K. Gass, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,953

Int. Cl.³ G06F *9/00, 13/00*

U.S. Cl. 364—200 **16 Claims**



1. A microcomputer system comprising:

(a) a microcomputer device formed in a single integrated circuit and having data input/output terminals and address output terminals;

(b) memory means external to the microcomputer device having an address input and data input/output means;

(c) input/output peripheral means for transfer for information to or from external equipment;

(d) external address bus means coupled to the address output terminals of the microcomputer device and to the address input of the memory means;

(e) external data bus means coupled to the data input/output terminals of the microcomputer device and to the data input/output means of the memory means;

(f) the microcomputer device comprising:

an arithmetic/logic unit having data input and data output;

an accumulator having an input receiving said data output of the arithmetic/logic unit and having an accumulator data output;

saturate-control means having input means and output means connected to the accumulator, said saturate-control means having an overflow latch responsive to said input means indicating that the contents of the accumulator has reached on overflow condition, said saturate-control means responsive to said overflow latch and the most significant bit of the data output of the arithmetic/logic unit to produce a fixed binary number at the

output means of the saturate-control means for loading into the accumulator;

a data memory having an address input and having data input/output means;

internal data bus means coupled to the data input of the arithmetic/logic unit and said accumulator data output are coupled to the data input/output means of the data memory;

an internal program memory having an address input and having an instruction output, the program memory storing instruction words:

program address means connected to the address input of the program memory means;

internal program bus means coupled to said instruction output, to said program address means and to said address output terminals,

control means having an input coupled to said internal program bus means for receiving instruction words and having means for generating controls in response to said instruction words; said controls being coupled to the arithmetic/logic unit, to the overflow latch, to the saturate-control means and to the internal data bus means, to define the operation thereof;

timing means having outputs coupled to said control means, to said internal data bus means, and to said internal program bus means, said timing means establishing overlapping operating cycles during one of which cycles:

data is transferred from the data input/output means of the data memory via said internal data bus means to the data input of the arithmetic/logic and the arithmetic/logic unit produces a result at said data input of the accumulator for one of said instruction words,

the control means receives an instruction word from the instruction output of the program memory via said internal program bus means for the next one of said instruction words,

said accumulator receives said saturate controls from said saturate-control means for a prior one of said instruction words,

and the program address means applies an address to the address input of the program memory for another succeeding one of said instruction words.

4,519,032

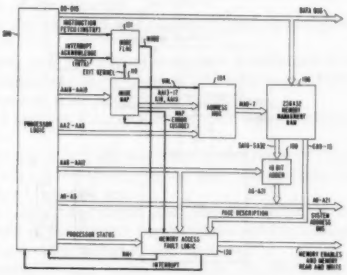
MEMORY MANAGEMENT ARRANGEMENT FOR MICROPROCESSOR SYSTEMS

Harry B. Mendell, New York, N.Y., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 9, 1982, Ser. No. 386,806

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **32 Claims**



1. A circuit for use in conjunction with a single user single mode processor, said processor having a set of pre-established input and output leads and operable for executing instruction sets, and operable in response to an interrupt signal for jumping from the instruction set currently being executed to a different instruction set under control of a vector address provided from an external memory, said circuit arranged to provide multi-user processing capability and comprising

means for establishing within said circuit at least first and second modes of operation,

means for dividing said external memory into blocks,

means for controlling said memory such that certain of said memory blocks are accessible by instructions executed by said processor while said circuit is in said first mode and certain of said memory blocks are accessible by instructions executed by said processor while said circuit is in said second mode,

said establishing means includes first means for switching from said first mode to said second mode under control of an interrupt, and

second means for switching from said second mode to said first mode by decoding output bits from said processor.

4,519,033

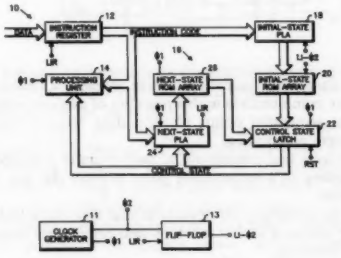
CONTROL STATE SEQUENCER

Herchel A. Vaughn, and Ashok H. Someshwar, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1982, Ser. No. 404,073

Int. Cl.³ G06F *9/06, 9/22*

U.S. Cl. 364—200 **5 Claims**



2. A control state sequencer for use with a microprocessor having a processing unit for processing instructions comprised of a predetermined sequence of control states, comprising:

a first ROM array, having a plurality of input lines each corresponding to a control state, programmed to provide, in response to an input line being enabled, the control state which corresponds to the input line which is enabled;

a first PLA having a plurality of input lines for receiving an instruction code representative of an instruction and for receiving a current control state of the represented instruction, and having a plurality of output lines coupled to the input lines of the first ROM array, wherein the first PLA is programmed to enable the input line of the first ROM array which corresponds to a next control state, wherein the next control state is a control state which follows the current control state in the predetermined sequence of control states of said represented instruction;

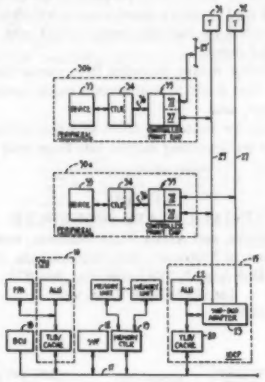
an initial-state ROM array, having a plurality of input lines, each corresponding to an initial control state of an instruction, programmed to provide to the first PLA, in response to an input line being enabled, the initial control state which corresponds to the input line which is enabled; and

an initial-state PLA having a plurality of input lines coupled to the input lines of the first PLA for receiving the instruction code representative of the instruction, and a plurality of output lines coupled to the input lines of the initial-state ROM array, wherein the initial-state PLA is programmed to enable the input line of the initial-state ROM array which corresponds to the initial control state of the instruction in response to receiving the instruction code and an instruction enable signal.

4,519,034
I/O BUS CLOCK

Gehrard J. Smith, Santa Clara, and Kenneth Holly, San Jose, both of Calif., assignors to ELXSI, San Jose, Calif.

Continuation-in-part of Ser. No. 393,860, Jun. 30, 1982,. This application Sep. 28, 1982, Ser. No. 426,046
Int. Cl.[3] G06F *1/04*
U.S. Cl. 364—200 20 Claims



1. In a data communication system wherein a channel processor may communicate with a plurality of devices coupled in parallel at sequential points along a data bus, an improved clock system comprising:

a first clock line originating at said channel processor and extending to a termination point beyond the last of said devices;

means for coupling said devices to said first clock line in the same sequence as that in which said devices are coupled to said data bus;

a second clock line having a first segment originating at said channel processor and extending to a turn-around point, and a second segment extending from said turn-around point toward said channel processor;

means for coupling said devices to said second segment in the reverse sequence to that in which said devices are coupled to said data bus; and

means associated with channel processor for driving said first clock line and said first segment of said second clock line at a common predetermined frequency to produce respective first and second clock signals, said first clock signal propagating along said first clock line away from said channel processor while being controlled by said channel processor, said second clock signal propagating along said second segment of said second clock line toward said channel processor while being controlled by said channel processor.

4,519,035
BRANCHED-SPIRAL WAFER-SCALE INTEGRATED CIRCUIT

John T. Chamberlain, Macclesfield, England, assignor to Burroughs Corporation, Detroit, Mich.

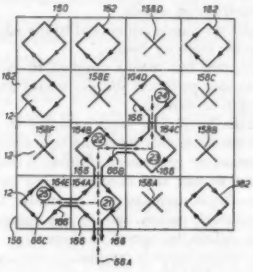
Filed Nov. 12, 1982, Ser. No. 441,314
Claims priority, application United Kingdom, Dec. 2, 1981, 8136339
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 28 Claims

1. A data processing system comprising:

an integrated circuit comprising a plurality of data-processing cells and a port, at least one of said plurality of cells being adjacent to said port, and

a controller, coupled to said at least one of said cells via said port to pass data, commands and associated command addresses to said circuit, where;

each of said plurality of cells is coupled to receive a connection from said controller, if not already in receipt of said connection, via a first neighboring cell, to receive a unique cell name from said controller, and to obey the associated command if a command address matches said unique cell name;



each of said plurality of cells responds to said commands selectably to provide or cease to provide said connection to any selectable one or more than one other neighboring cell or cells;

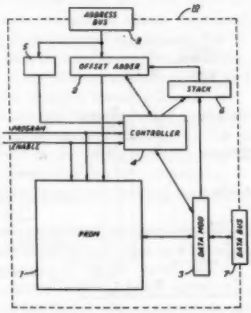
said controller tests each cell newly in receipt of said connection by the provision of test data thereto and the examination of return data therefrom; and where

said controller issues commands to said cells to grow a branched-spiral of interconnected cells which have passed said test starting with said at least one of said cells.

4,519,036
PROGRAM STORAGE HARDWARE WITH SECURITY SCHEME

Ian M. Green, Buckie, Scotland, assignor to EMI Limited, Hayes, England

Filed Jan. 5, 1983, Ser. No. 455,738
Int. Cl.[3] G06F *1/00*
U.S. Cl. 364—200 17 Claims



1. A program storage device for a computer, the device including means capable of falsifying output data and further including complementary systems capable, in response to false inputs occuring as a consequence of said false output data, of correcting said false inputs.

4,519,037

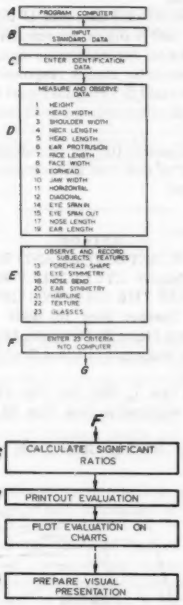
COMPUTER ASSISTED SYMMETRICAL ANALYSIS FOR HAIR STYLISTS

Jacques Brodeur, and Mireille Brodeur, both of 1546 Armida Verde Vista, San Dimas, Calif. 91773

Continuation of Ser. No. 55,012, Jul. 5, 1979, abandoned. This application Dec. 3, 1981, Ser. No. 327,195

Int. Cl.[3] G06F *15/20*

U.S. Cl. 364—400 19 Claims



1. A method of analyzing an individual subject person's physical characteristics to assist in hair styling comprising:

measuring a plurality of values of the person's height and head dimensions.

inputting said measured values of physical measurements of the subject person into a digital computer and temporarily storing said values therein,

inputting into the digital computer predetermined values of normal ratios of the height and head dimensions for subjects of the same sex,

storing the values of said normal ratios in said digital computer,

inputting into said digital computer predetermined recommendations of distribution of hair volume as a function of deviations from said normal ratios,

storing said recommendations in said digital computer in a table,

calculating in said digital computer the ratios of the subject person corresponding to the said normal ratios for subjects of the same sex,

calculating in said digital computer the deviations between values of the subject person ratios and the values of the normal ratios stored in said computer,

comparing in said digital computer the deviations of the ratios of said subject person with the stored recommendations,

driving with said computer a display device which displays the recommendations for hair volume distribution corresponding to the correspondence of said recommendations with the deviations of the ratios of said subject person and said recommendations, and

manually preparing a chart representing said recommendations on a facial outline.

4,519,038

OPTIMIZING SPARK TIMING CONTROL APPARATUS AND METHOD

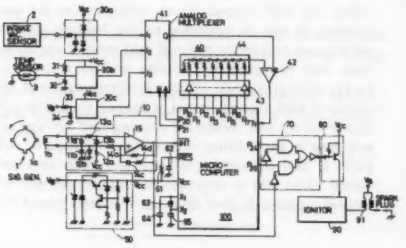
Takeski Matsui, Toyohashi; Hideo Ohyama, Toyota; Ryosuke Tachi, Kariya; Teruyoshi Ito, and Motoshi Kawai, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1982, Ser. No. 381,508

Claims priority, application Japan, May 27, 1981, 56-80572

Int. Cl.[3] F02P *5/08;* F02B *5/02*

U.S. Cl. 364—431.03 8 Claims



3. A method for generating a rectangular wave output signal in accordance with a predetermined engine crankshaft position, comprising the steps of:

(a) generating a reference pulse having a leading edge advanced with respect to said predetermined crankshaft position as a function of the speed of rotation of the crankshaft and having a trailing edge substantially coinciding with said predetermined crankshaft position;

(b) detecting the trailing edge of a preceding reference pulse and deriving from engine power demand and engine crankshaft speed a first value and successively decrementing said first value;

(c) detecting whether the crankshaft speed is higher than a predetermined value;

(d) detecting the occurrence of (1) said first value being reduced to zero and of (2) the leading edge of a subsequent reference pulse, causing a voltage to rise in response to the detection of the earlier of either one of occurrences (1) and (2) if the crankshaft speed is higher than said predetermined value, and causing said voltage to rise in response to the detection of occurrence (2) if the crankshaft speed is lower than said predetermined value;

(e) deriving from said engine power demand and engine crankshaft speed a second value and successively decrementing said second value; and

(f) detecting the trailing edge of said subsequent reference pulse and causing said voltage to fall in response to the detection of the trailing edge if said crankshaft speed is lower than said predetermined value; and

(g) detecting when said second value reduces to zero and causing said voltage to fall in response to the detection of the second value becoming zero if said crankshaft speed is higher than said predetermined value.

6. Apparatus for generating a rectangular wave output signal in accordance with a predetermined crankshaft position of an internal combustion engine which is controlled in response to engine power demand, comprising:

means for generating a first signal representing the amount of power demand of said engine;

means for generating a second signal representing the speed of rotation of the engine crankshaft;

means for generating a reference pulse having a leading edge advanced with respect to said predetermined crankshaft position by an amount that is a function of said second

signal representing the crankshaft rotation speed and having a trailing edge substantially coinciding with said predetermined crankshaft position;

means for generating clock pulses;

control means comprising means for detecting whether said second signal is higher or lower than a predetermined value, means for deriving from said first and second signals, in response to the trailing edge of a preceding reference pulse, a first and a second value representing respectively first and second optimum periods of time, means for counting said clock pulses in response to said trailing edge to provide a first count value and counting said clock pulses in response to the leading edge of a subsequent reference pulse to provide a second count value, means for detecting a first match between said first value and said first count value and a second match between said second value and said second count value, means for causing a voltage to rise in response to the leading edge of said subsequent reference pulse if said second signal is lower than said predetermined value and in response to the earlier occurring one of said leading edge and said first match if said second signal is higher than said predetermined value, and means for causing said voltage to fall in response to the trailing edge of said subsequent reference pulse if said second signal is lower than said predetermined value and in response to said second match if said second signal is higher than said predetermined value.

4,519,039

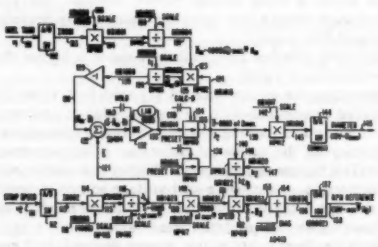
DIGITAL COIL DIAMETER FUNCTION GENERATOR AND REEL MOTOR DRIVE SYSTEM EMBODYING THE SAME

Bhupendra S. Surana, East Amherst, and William H. Snedden, Newstead, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1982, Ser. No. 401,425

Int. Cl.³ G06G 7/26

U.S. Cl. 364—469 **2 Claims**



1. In a line for processing a strip of material at a controllable strip velocity between a pay-off and a winding reel driven at a controllable speed, a motor drive system for controlling the speed of one of said pay-off and winding reels, in relation to a motor speed representative signal and a strip speed representative signal, comprising:

a program controller including:

first A/D converter means operative upon each of successive scan time intervals (T) for converting said strip velocity signal into a first digital signal S representative of strip velocity;

second A/D converter means operative upon each of successive scan time intervals for converting said reel speed signal into a second digital signal N representative of reel speed;

means responsive to said N digital signal and to a digital representation of the actual diameter D of the wound coil upon said reel at the beginning of a new scan time interval for calculating the product ND;

means responsive to the product ND and to said S digital signal for deriving an error (S−ND);

integrating means responsive to said error (S−ND) for increasing said digital representation D by a corresponding and proportionate amount at the end of a current time interval (T) to provide a new initial diameter for the next time interval;

first D/A converter means responsive upon each scan time interval to said diameter D digital representative signal for deriving a diameter D instantaneous value analog representative signal;

means responsive to said diameter D digital representative signal and to said S digital representative signal for providing S/D digital representative signal; and

second D/A converter means responsive upon each scan time interval to said S/D digital signal for deriving a speed reference signal in accordance with said new initial diameter;

said motor drive system further including means for controlling the speed of said reel in accordance with said speed reference signal.

4,519,040

METHOD FOR DETECTING AND RECOGNIZING DEVIATIONS OF CYCLICALLY RECURRING PROCESSES FOR THE SHAPING OF WORKPIECES

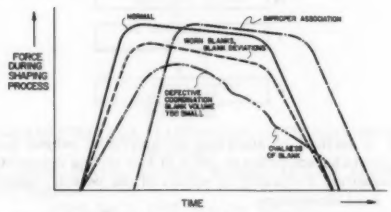
Klaus Brankamp, Sperber Weg 10, 4006 Erkrath 1; Volker Bialas, Hilden, and Heinz B. Bongartz, Düsseldorf, all of Fed. Rep. of Germany, assignors to Klaus Brankamp, Erkrath, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,010

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136433

Int. Cl.³ G06F 15/46

U.S. Cl. 364—474 **5 Claims**



1. A method of detecting and recognizing deviations from a normal course of cyclically recurring processes for the shaping of workpieces from the solid by cold-working, particularly upon the profiling of elongated blanks of circular cross section by shaping from the solid, for instance upon thread-rolling, the improvement comprising

determining values of force employed to carry out a shaping process in case of the normal course of the shaping of a workpiece at a suitable and significant point of a tool from the start to the end of the course of force,

storing said values of force,

determining corresponding values of force for each of the cyclically recurring shaping processes on the workpieces,

comparing said corresponding values with the values stored and determining values deviating from the stored values, and

taking corrective action so as to eliminate a source of error when the deviating values exceed a predetermined range of tolerance according to the nature of the deviation, and wherein said step of taking corrective action includes checking the association of parts of the tool with respect to each other and/or the blanks based on the deviation values corresponding to a deviation at the start and/or the end of the course of the force from the normal course of

the shaping process, and readjusting said association if necessary.

4,519,041

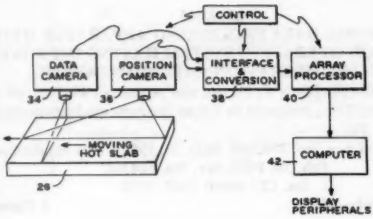
REAL TIME AUTOMATED INSPECTION

Karl M. Fant, Minneapolis; Richard A. Fundakowski, Saint Paul; Tod S. Levitt, Minneapolis; John E. Overland, Plymouth; Bindinganavle R. Suresh, New Brighton, and Franz W. Ulrich, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 3, 1982, Ser. No. 374,373

Int. Cl.³ G06F *15/20, 15/46;* **G06G** *7/48*

U.S. Cl. 364—552 **24 Claims**



1. A method for the real time automatic detection and classification of characteristic type surface imperfections occurring on the surfaces of material of interest comprising the steps of;

transversely scanning a relatively moving surface of said material of interest with data generating means to sense the light intensities of scanned pixels and generating signals indicative of the sensed intensities of said scanned pixels;

converting said signals to corresponding digital values to form a digital image of said surface and storing said digital values;

edge enhancing said digital image formed by said digital values with an edge enhancement operator on the fly to form an edge enhanced image containing intervals of said image corresponding to the edges of said surface imperfections;

thresholding said edge enhanced image to segment out said edges to form a thresholded image;

interval matching said thresholded image to establish connectivity of intervals on adjacent scan lines and bin tracking connected ones of said interval (threshold image) to track and segment out imperfection objects formed by said edges;

forming object feature vectors by computing and accruing directly determinable features including an object identifier of each of said objects; and

classifying said objects with the aid of said features into characteristic type surface imperfections.

4,519,042

METHOD OF INDICATING RESULTS OF COMBINATORIAL COMPUTATIONS

Kazukiyo Minamida, and Yoshiharu Asai, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

PCT No. PCT/JP81/00176, § 371 Date Mar. 23, 1982, § 102(e) Date Mar. 23, 1982, PCT Pub. No. WO82/00711, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 13, 1981, Ser. No. 384,859

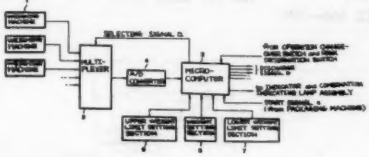
Claims priority, application Japan, Aug. 20, 1980, 55-115009

Int. Cl.³ G01G *13/00, 19/42*

U.S. Cl. 364—567 **6 Claims**

1. In a combinatorial system for measuring the respective values of a physical quality of a plurality of sets of objects such as the weight or quantity thereof, computing a plurality of combinatorial values of said measured values, and discharging those sets of objects the total combinatorial value of which most closely approximates a set value, the method of indicating the results of said combinatorial computations comprising the steps of:

arranging said combinatorial values in ranking order of closest approximation to said set value;



storing a numerical value representative of each of said combinatorial values and the combination corresponding thereto;

selectively retrieving one of said stored numerical values by rank and displaying said selected value on a visual numerical display.

4,519,043

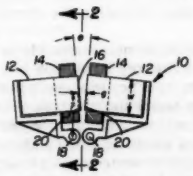
SOLENOID ACTIVATED CLOSURE DEVICE

David H. La Forge, and Peer M. Portner, both of Kensington, Calif., assignors to Novacor Medical Corporation, Oakland, Calif.

Filed Jul. 20, 1982, Ser. No. 400,027

Int. Cl.³ G01B *7/14;* **A61F** *1/00*

U.S. Cl. 364—571 **8 Claims**



1. In a solenoid activated closure device having a pair of poles in a facing relationship to each other and normally biased apart from each other defining a gap therebetween, said poles being accelerated toward each other when said device is activated, a method for substantially eliminating impact of said poles against each other after activation of said device, said method comprising the steps of:

a. measuring an initial width of said gap;

b. measuring an instantaneous width of said gap at selected time intervals after activation of said device;

c. computing an instantaneous rate of closure of said gap from each instantaneous width and computing an error between each instantaneous rate and a predetermined rate of closure;

d. adjusting said instantaneous rate as a function of said error; and

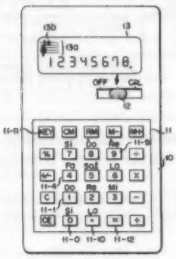
e. repeating steps b-d until closure of said device is determined.

4,519,044

SMALL-SIZED ELECTRONIC CALCULATOR CAPABLE OF FUNCTIONING AS A MUSICAL INSTRUMENT

Eiichi Munetsuga, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 9, 1981, Ser. No. 319,412
Claims priority, application Japan, Nov. 13, 1980, 55-159925
Int. Cl.³ G06F 3/16
U.S. Cl. 364—709 **1 Claim**



1. An electronic musical tone generating system operable in conjunction with an electronic calculator having data input keys, said system comprising:

memory means having storage locations for storing tone codes;

tone generating means for producing audible output tones and including tone control means for selecting the frequency of said output tones in response to tone code input signals, said tone control means including register means for storing said tone code selected from said memory means, decode means for decoding said selected tone code to produce an address signal, ROM means receiving said address signal and supplying at its output in response thereto a frequency division code, and variable frequency signal generation means responsive to said frequency division code for generating a signal of predetermined frequency for controlling the frequency of said audible output tone;

means operated by said data input keys for generating key input codes indicating the identity of an activated input key;

function control means operable in response to the generation of a first key input code produced by activation of a first data input key to access a first storage location in said memory means and to supply to said tone control means a first stored tone code, whereby activation of said first data input key produces a first audible output tone; and

key selection means responsive to activation of a second data input key for changing the operation of said function control means such that said first key input code accesses a second storage location in said memory means and supplies to said tone control means a second stored tone code, whereby activation of said first data input key following operation of said key selection means produces a second audible output tone having a frequency different from said first audible output tone;

said tone generating means further including:

a frequency division register for storing said frequency division code supplied by said ROM means;

a plurality of AND circuits connected such that a first input terminal of each said AND circuit receives a different digit of said stored frequency division code;

a plurality of binary counters each having a Q output, a set input, a trigger input, and a reset terminal, each said counter being connected via its reset terminal to the output of one of said AND circuits and said counters being cascade-connected through interconnection of the Q output and trigger input of respective adjacent counters;

a reference pulse generator circuit for supplying a reference frequency signal to the trigger input of the first stage binary counter;

a NOR circuit to which is applied the Q output from each of said binary counters;

a flip-flop connected to receive the output of said NOR circuit;

means for supplying the output of said flip-flop commonly to the set inputs of said binary counters and to second input terminals of each of said AND circuits; and

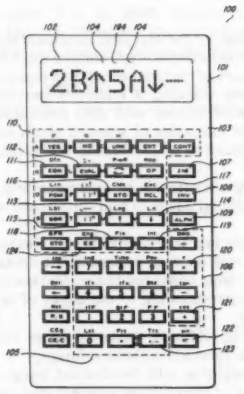
means for producing said audible output tones having a frequency contolled by the output of said flip-flop.

4,519,045

ELECTRONIC DATA PROCESSING APPARATUS WITH EQUATION OPERATING SYSTEM HAVING IMPROVED UNARY OPERATION IMPLEMENTATION

David Caldwell; Linda J. Ferrio, and Arthur C. Hunter, all of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 381,985, May 25, 1982,. This application Feb. 29, 1984, Ser. No. 584,707
Int. Cl.³ G06F 7/48, 3/02
U.S. Cl. 364—709 **8 Claims**



1. An electronic data processing apparatus comprising:

an input means for entering data processing functions including numeric data and a plurality of operational commands, said operational commands including at least one unary operational command corresponding to a data processing operation having a single operand, and including at least one unary operation completing command;

and arithmetic means for performing entered data processing functions and generating a numeric result, said arithemtic means including a unary operation means for performing unary operational commands upon entry of a unary operation completing command employing the numeric data entered after entry of said unary operational command as the operand if numeric data is entered after entry of said unary operational command prior to entry of said unary operation completing command, and for performing entered unary operational commands on the numeric data entered prior to entry of said unary operational command if no numeric data is entered following entry of said unary operational command prior to entry of said unary operation completing command; and

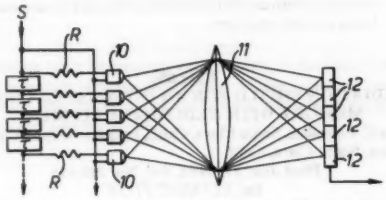
an output means for generating an operator perceivable indication of said numeric result generated by said arithmetic means.

4,519,046

SIGNAL PROCESSING APPARATUS AND METHOD

Trevor W. Cole, 28 Gordon Crescent, Stanmore, New South Wales 2048, Australia

PCT No. PCT/AU80/00109, § 371 Date Aug. 7, 1981, § 102(e) Date Aug. 7, 1981, PCT Pub. No. WO81/01927, PCT Pub. Date Jul. 9, 1981
PCT Filed Dec. 16, 1980, Ser. No. 293,225
Claims priority, application Australia, Dec. 19, 1979, PE1784
Int. Cl.³ G06G *9/00*; H03K *19/14*
U.S. Cl. 364—822 18 Claims



1. A correlator for performing autocorrelation, comprising:

(a) a linear array of illumination control elements each having a first optical state in which a first light output is provided and a second optical state in which a second light output is provided, each said element changing from its first optical state to its second optical state when a voltage is applied across it, each element being adapted to receive two voltage signals, the optical state of each element at any instant being dependent on the relative values of the voltage signals;

(b) means for applying a voltage signal from a single signal source to one input of each element in the linear array, said voltage signal from said single signal source representing a signal to be autocorrelated;

(c) means for applying said signal from said single signal source, after a delay thereof by a respective integral number of time delay periods, to the other input of each element in the linear array; and

(d) an array of photodiodes, each photodiode receiving light from a respective one of said elements and providing an output signal responsive to said received light, the output signals of said photodiodes representing an autocorrelation of said signal to be correlated.

14. A method of correlating a plurality of pairs of quantized electrical signals, comprising the steps of:

(a) applying each pair of quantized signals to the two terminals of a respective element in an array of illumination control elements each having a first optical state in which a first light output is provided and a second optical state in which a second light output is provided, each element having two terminals and changing from its first optical state to its second optical state when a voltage difference is applied across its two terminals;

(b) observing the optical state of each element in the array by focusing the light from each element onto a respective photodiode in an array of photodiodes which is complementary to said array of elements; and

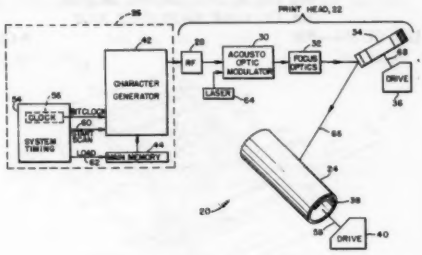
(c) reading out the information contained in said complementary array of photodiodes, said information contained in said complementary array of photodiodes representing a correlation of said plurality of pairs of quantized electrical signals.

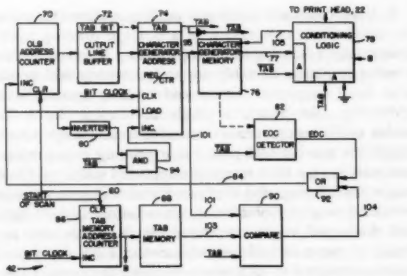
4,519,047

PRINTER WITH POSITIONAL TABBING

George W. Crozier, Hatfield, and Bernard J. McDevitt, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,759
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 11 Claims





1. A printing system for providing a proportional width mode and a columnar mode of presenting printed material comprising:

a character recording medium;

means for printing characters on said medium, said medium movable relative to said printing means for the printing of successive lines of said characters;

timing means for synchronizing movement of said printing means and said recording medium;

character generator means for driving said printing means, said timing means including a clock for clocking said character generator means, said character generator means comprises a character memory storing components of characters to be printed by said printing means, a separate address of said memory corresponding to each of said stored components;

counter means for addressing said character memory;

means for presetting said counter means with the starting address of a character, said counter means counting through successive addresses of the components of the character in response to clock signals of said clock;

tab memory means for storing a print signal at an address corresponding to the location of the leading edge of a column;

comparator means for comparing the output of said tab memory means with a tab signal for designating the starting point of a character for positions of characters in a columnar presentation, said character memory including an output circuit for signaling the end of a character for proportional width printing; and

means for alternatively coupling said presetting means to said output circuit and to said comparator to select a

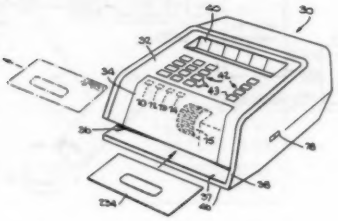
proportional width mode and columnar mode of character presentation.

4,519,048

POSTAGE METER SYSTEM FOR COMMUNICATING PLATEN MOVEMENT TO A MICROPROCESSOR TO SIGNAL COMPLETION OF PRINTING

Jovito N. Abellana, and Edward C. Duwel, both of Trumbull, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,904
Int. Cl.³ G06F *15/21, 3/12, 3/02*
U.S. Cl. 364—900 **6 Claims**



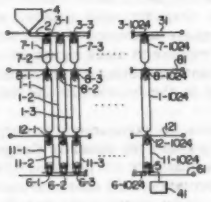
1. A self-contained electronic mailing machine having means for determining completion of a postage printing operation, comprising: a housing, a microprocessor received within said housing, a platen movably supported within said housing, a print head supported within said housing spaced from and addressing said platen, a single revolution clutch located within said housing, means connected to said single revolution clutch for moving said platen into printing engagement with said print head, a shaft rotatably supported within said housing, means for rotating said shaft, said shaft being in engagement with said single revolution clutch whereby upon rotation of said shaft, said single revolution clutch causes said moving means to move said platen into contact with said print head means connected to said microprocessor for sensing the rotation of said shaft, whereby upon rotation of said shaft said sensing means will sense the rotation of said shaft and send a signal to said microprocessor to communicate the activation of said single revolution clutch and the completion of a printing operation.

4,519,049

MAGNETIC BUBBLE MEMORY HAVING AUXILIARY STORAGE LOOPS

Takashi Toyooka, Sayama; Hirokazu Aoki, Hachioji, and Mamoru Sugie, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,510
Claims priority, application Japan, Dec. 4, 1981, 56-194521
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—12 **12 Claims**



1. A magnetic bubble memory for accessing stored data sequences by the presence or absence of magnetic bubble domains, comprising:

a plurality of minor loops for circulating the stored data sequences;

data updating means coupled to said plurality of minor loops for updating the data sequences;

first replicator means for replicating the data sequences of said plurality of minor loops;

a plurality of auxiliary loops coupled to said first replicator means for ciculating the replicated data sequences;

a read line for transferring the data sequences to be read from said auxiliary loops; and

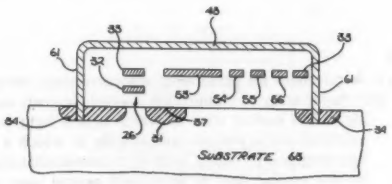
second replicator means coupled to said read line and said auxiliary loops and for replicating the data in said auxiliary loops to said read line.

4,519,050

RADIATION SHIELD FOR AN INTEGRATED CIRCUIT MEMORY WITH REDUNDANT ELEMENTS

Alan C. Folmsbee, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 17, 1982, Ser. No. 389,415
Int. Cl.³ G11C *11/34*
U.S. Cl. 365—53 **6 Claims**



1. In a metal-oxide-semiconductor (MOS) electrically programmable read only-memory (EPROM) which is fabricated on a substrate and which is erased when exposed to radiation, an improvement comprising:

redundant elements to be used in place of defective elements;

a programming means for programming said redundant elements so as to cause said redundant elements to be used in place of said defective elements, said programming means including at least one EPROM cell which is erased when exposed to radiation; and

a shielding member comprising an upper cover and upstanding members extending from said upper cover to said substrate disposed about said EPROM cell which causes radiation incident on said memory to be attenuated before striking said EPROM cell thus inhibiting said EPROM cell from being erased when said memory is exposed to radiation;

whereby said EPROM cell can be permanently programmed so that said redundant elements are always used in place of said defective elements.

4,519,051

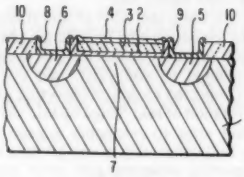
MNOS TYPE NON-VOLATILE MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME

Tatsuo Fuji, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,989
Claims priority, application Japan, Oct. 16, 1981, 56-165339
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—184 **2 Claims**

1. An MNOS type non-volatile memory comprising a semiconductor substrate of one conductivity type, source and drain regions of the opposite conductivity type provided in said semiconductor substrate, a thin silicon oxide layer provided on a channel region between said source and drain regions, a

silicon nitride layer provided on said thin silicon oxide layer and having trap states therein, and a gate electrode provided on said silicon nitride layer, the density of trap states in said



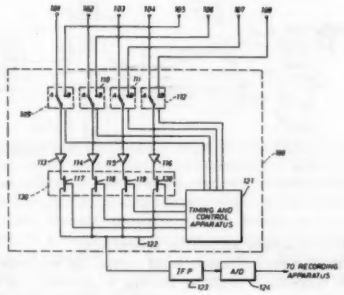
silicon nitride layer decreasing continuously in the direction from the interface between said silicon nitride layer and said silicon oxide layer to the interface between said silicon nitride layer and said gate electrode.

4,519,052

ELECTRONIC ROLL-A-LONG SWITCH

Donnie J. Tantillo, Houston; David F. Kratochvil, Sugarland; Robert G. Moore, and Edward M. Browne, both of Houston, all of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Jun. 16, 1981, Ser. No. 274,216
Int. Cl.³ G01V *1/22*; H04Q *11/04*
U.S. Cl. 367—79 **12 Claims**



8. An electronic roll-a-long switch for use in a seismic exploration system, said system including N receiver points, which are sequentially numbered and which are located at spaced intervals along the earth's surface, and a recording system having M channels for recording seismic data, comprising:

N/2 input channels, each channel including a preamplifier having an input and an output, and a two possible-position, electronic input switch for connecting the input of its associated preamplifier to either of two receiver points which are spaced N/2 receiver points apart;

a multiplexer for time-division multiplexing the outputs of the preamplifiers to a signal bus;

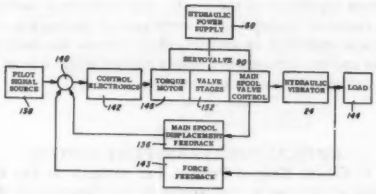
timing and control circuitry for operating the multiplexer during each channel sample time of a record interval time to connect the preamplified signals from a group of M receiver points to the signal bus in a sequential order corresponding to the sequential numbers of the receiver points of that group, and for changing the group of N/2 receiver points which are connected to the inputs of the preamplifiers during a successive recording interval.

4,519,053

FORCE OR PRESSURE FEEDBACK CONTROL FOR SEISMIC VIBRATORS

John W. Bedenbender, Ponca City, Okla., and Gilbert H. Kelly, deceased, late of Irving, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 325,618, Nov. 27, 1981, abandoned, which is a continuation of Ser. No. 870,236, Jan. 17, 1978, abandoned, which is a continuation of Ser. No. 673,854, Apr. 5, 1976, abandoned, which is a continuation of Ser. No. 427,899, Dec. 26, 1973, abandoned. This application Oct. 1, 1984, Ser. No. 655,999
Int. Cl.³ G01V *1/14*
U.S. Cl. 367—190 **4 Claims**



1. A seismic vibrator source having a reaction mass comprising:

(a) a vibrator means for imparting acoustic energy into the earth, including a baseplate structure for contacting the earth connected to the reaction mass;

(b) a drive means for vibrating the vibrator means;

(c) a force measuring transducer means integral with said vibrator means and operative responsive to the vibrator means to produce electrical signals directly representative of the force applied to the earth, the force including the weight of the reaction mass and the weight of the baseplate structure mass, to thereby accurately represent a decoupling condition for controlling the drive means; and

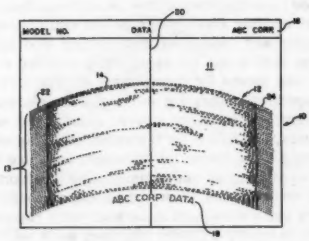
(d) comparator means for comparing the electrical signals representative of the force with a predetermined representative value for maintaining the force at that corresponding to that of the predetermined representative value.

4,519,054

METHOD FOR FORMATTING OPTICALLY ENCODED DIGITAL DATA ON A SUBSTRATE AND THE DATA RECORD CARRIER FORMED THEREBY

Alan A. Jewer, Whitewater, Wis., assignor to News Log International, Inc., Janesville, Wis.

Continuation-in-part of Ser. No. 384,582, Jun. 3, 1982,. This application Aug. 2, 1982, Ser. No. 404,507
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—30 **47 Claims**



1. A method for formatting optically encoded digital data on a planar substrate without timing or synchronization data to

form a data record carrier including the steps of: selecting an arcuate track path on the substrate for each one of a plurality of tracks of data; selecting a data cell length in the direction of each track for each bit of data to be stored in each cell on each track; selecting a cell width dimension transverse to the direction of the track; selecting a non-transition cell for one form of logic (0 to 1) to be stored in each such cell; selecting a transition cell for the other form of logic (1 or 0) to be stored in each such other cell; establishing a leader section for each track; establishing a tailer section for each track; establishing a front track address section for each track; establishing a back track address section for each track and creating on said substrate a plurality of such arcuate tracks with the above parameters, and with each track being spaced from an adjacent track along a common centerline of the tracks, and each track having the same radius throughout the arcuate path of the track such that the tracks extend in an arcuate manner across the data record carrier and are arranged in a nested manner relative to adjacent tracks along said common centerline.

4,519,055

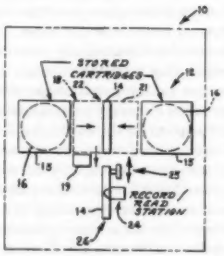
OPTICAL DISC TRANSPORT SYSTEM

Alan P. Gilson, King of Prussia, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1983, Ser. No. 486,477

Int. Cl.[3] G11B *17/00*

U.S. Cl. 369—37 **1 Claim**



1. An optical disc transport system comprising

a cartridge storage module, said cartridge storage module having a plurality of rectangular shaped cartridges removably stored therein, said cartridges having discs contained therein, said storage module being donut shaped,

a changer, said changer being centrally located in said cartridge storage module, said changer being rotatably driven for accessing said cartridges, said changer reciprocally transporting a selected cartridge between said cartridge storage module and a transfer location within said changer, said changer having a housing centrally located in said cartridge storage module; driving means for selectively rotating said housing within said cartridge storage module; and means for transporting said selected cartridge, said means for transporting attached to said housing, said means for transporting having a reciprocating transporting means for moving said selected cartridge between said cartridge storage module and said transfer location; and means for releasably engaging said selected cartridge, said means for releasably engaging attached to and translating on said reciprocating transporting means; said reciprocating transporting means including a ball screw and a drive, said drive selectively rotating said ball screw whereby a carrier translates upon said ball screw, said carrier including

a carriage translatably attached to said reciprocating transporting means;

a frame fixedly attached to said carriage;

means for selectively rotating a shaft, said means for selectively rotating fixedly attached to said carriage;

a pair of transporting arms for releasably engaging said selected cartridge, said transporting arms pivoted on one end to said frame; and

means for connecting said shaft to said transporting arms, said means for connecting including a plurality of connecting rods rotatably connected to a flange, said flange fixedly mounted to said shaft, said connecting rods operably connected to said transporting arms such that selective rotation of said flange by said shaft causes said transporting arms to releasably engage said selected cartridge, said connecting means pivoted to one end to said transporting arms near said pivot connecting said arms to said frame whereby motion of said connecting means causes said arms to rotate about said pivots in said frame; and

a data interface unit, said data interface unit attached to said changer, said data interface unit reversibly transporting said selected cartridge from said transfer location in said changer to a read/record station within said data interface unit.

4,519,056

OPTICAL DISK APPARATUS

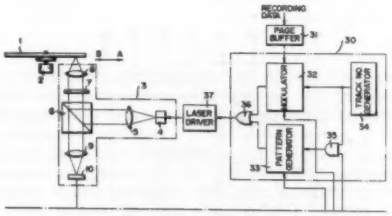
Katsumi Kimoto, and Atsushi Ishihara, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 9, 1983, Ser. No. 473,629

Claims priority, application Japan, Mar. 15, 1982, 57-40605; Mar. 15, 1982, 57-40608

Int. Cl.[3] G11B *7/00*; H04N *5/76*

U.S. Cl. 369—43 **8 Claims**



1. A data recording apparatus, comprising:

(a) recording/reproduction head means for recording data on a recording medium having a plurality of tracks formed at a predetermined trace pitch, for reproducing the data from the recording medium and for detecting and outputting a detection result corresponding to a desired recording start track;

(b) moving means, connected to said recording/reproduction head means, for moving said recording/reproducing head means on the recording medium;

(c) position detecting means having a predetermined scale pitch for detecting the position of the head and for outputting a scale value corresponding to positions of the recording medium:

(d) scale translating means for translating a desired track number to a scale value corresponding to said scale value detected by said position detecting means in accordance with the track and scale pitches;

(e) driving means, connected to said scale translating means, said position detecting means and said moving means, for driving said moving means until the scale value from said scale translating means coincides with the scale value detected by said position detecting means; and

(f) controlling means, connected to said recording/reproduction head means, said position detecting means, said scale translating means, and said driving means, for detect-

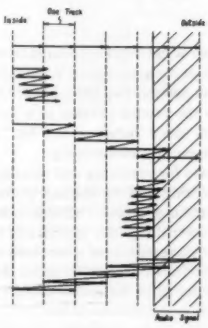
ing when access to the recording start track cannot be made by said recording/reproduction head for recording the data, for determining a track number in the vicinity of the recording start track in accordance with said detection result output by said recording/reproduction head means, and for controlling said recording/reproduction head means, said position detecting means, said scale translating means and said driving means so as to move said recording/reproduction head means to a target track ahead of a predetermined number of tracks which corresponds to a distance between the target track and the recording start track.

4,519,057

DIGITAL AUDIO DISC PLAYER INCLUDING APPARATUS FOR FINDING THE BEGINNING OF A RECORDED AUDIO SIGNAL

Teruaki Higashihara, Tokyo; Chiaki Nonaka; Tadao Yoshida, both of Kanagawa, and Hideo Kawachi, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,120
Claims priority, application Japan, Aug. 21, 1981, 56-131909
Int. Cl.³ G11B *7/00, 17/02, 27/10*
U.S. Cl. 369—50 **14 Claims**



1. An apparatus for optically reproducing audio information recorded on an optical disc in substantially circular tracks on the latter, said information being recorded in at least one signal segment having a beginning portion which is intended to be the first portion thereof reproduced and which is immediately preceded by a blank segment; said apparatus comprising:

means for rotating said disc at a constant linear velocity;

pickup means for reproducing said information recorded on said disc in said tracks;

tracking control means for adjusting the tracking position of said pickup means in forward and reverse directions which are transverse with respect to said tracks; and

means operative through said tracking control means for selectively establishing a slow-playback mode and a reverse slow-playback mode in each of which, after said pickup means reproduces a respective predetermined first number of said tracks while moving in said forward transverse direction, said tracking position of said pickup means is moved in said reverse transverse direction a respective predetermined integral number of said tracks, said predetermined integral number of said tracks being less than twice said predetermined first number of said tracks;

said means operative through said tracking control means also selectively establishing a standby mode in which, after said pickup means reproduces a given integral number of tracks while moving in said forward transverse direction, said tracking position of said pickup means is moved said given integral number of tracks in said reverse transverse direction;

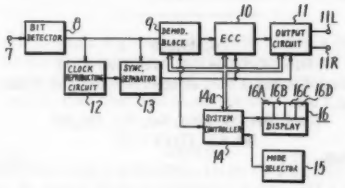
whereby said pickup means is adapted first to find, and then to remain poised at, said beginning portion of said signal segment.

4,519,058

OPTICAL DISC PLAYER

Katsuaki Tsurushima, Kawasaki; Tsuneo Furuya, Tokyo, and Tadashi Fukami, Koganei, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,215
Claims priority, application Japan, Aug. 31, 1981, 56-136844
Int. Cl.³ H04N *5/76*; G11B *7/00*
U.S. Cl. 369—53 **5 Claims**



1. In an optical disc player for playing an optical disc having a digital data including an error detecting code thereon and wherein digital data is obtained and supplied to an error detecting and correcting circuit means for at least indicating whether or not digital words have been corrected, wherein the improvement comprises:

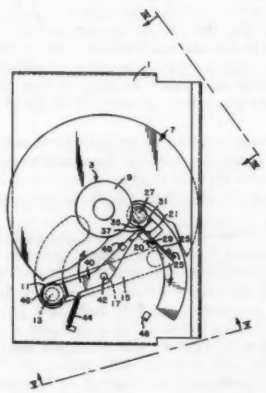
indicating means responsive to the error detecting and correcting circuit means and for providing an indication to a user of the optical disc player of a measure of contamination of the optical disc being played.

4,519,059

CLEANING MODE FOR DISCS OR RECORDS

Philippe V. Denis, Genappe, Belgium, assignor to Staar S. A., Belgium

Filed Nov. 18, 1983, Ser. No. 553,189
Claims priority, application Belgium, Apr. 15, 1983, 210,556
Int. Cl.³ G11B *3/58, 21/02*
U.S. Cl. 369—74 **12 Claims**



1. In an apparatus for transferring information to or from a disc, which apparatus includes a base, means for rotating the disc, means for transferring information to or from the disc, said information transferring means held by an arm movably mounted on the base to shift said information transferring

means across the surface of the disc in one direction or the opposite direction between the periphery and substantially the center, a disc cleaning device comprising:

means for cleaning the disc mounted movably on said arm;

means for moving said disc cleaning means into a disc-contacting cleaning position on a surface of the disc when said information transferring means is in an inoperative mode and for moving said disc cleaning means while in a cleaning position across the surface of the disc in one direction while said information transferring means is shifted across the surface of the disc in the opposite direction and remains in an inoperative mode; and

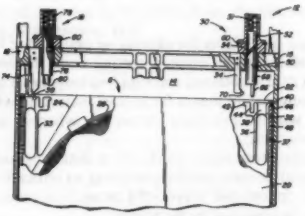
means for disassociating said disc cleaning means from the surface of the disc when said information transferring means is in an operative mode.

4,519,060

DISC LATCHING MECHANISM

John A. Ycas, Boulder, Colo., assignor to Reference Technology, Boulder, Colo.

Filed Nov. 29, 1983, Ser. No. 556,507
Int. Cl.³ G11B *5/82*
U.S. Cl. 369—77.2 **13 Claims**



1. A disc latching mechanism for use with a disc system of the type including a disc drive, a disc mounted for rotation within a disc carrier, the disc carrier and disc temporarily housed within a protective cartridge when outside of the disc drive, the mechanism comprising:

a catch member mounted to the carrier and biased in a first direction to a first position;

a catch member actuator mounted within the disc drive and positioned to engage said catch member when the protective cartridge, and the disc carrier and disc therewith, is inserted into the disc drive, said actuator arranged and adapted to bias said catch member in a second direction to a second position during insertion of said disc carrier and to maintain said catch member in said second position when the protective cartridge is retracted from the disc drive;

a carrier stop mounted to the disc drive and positioned to engage said catch member when said catch member is in said second position to prevent the retraction of the disc carrier as the cartridge is retracted from the disc drive; and

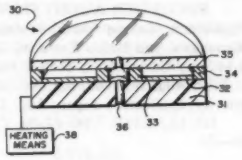
said catch member actuator including a rotatable cam member mounted for axial movement between retracted and extended positions, said cam member including a circumferential cam groove having first, second, third and fourth groove segments, said first and third groove segments arranged and adapted to rotate said cam member in a first rotary direction during said respective insertion and reinsertion of said cartridge, said second and fourth groove segments arranged and adapted to maintain a generally constant rotary orientation of said cam member during said retraction and withdrawal of said cartridge, said cam member eccentrically coupled to said catch member to move said catch member from said first position to said second position during insertion of said cartridge and from said second position to said first position during reinsertion of said cartridge and to maintain said catch member in said second position during retraction and withdrawal of said cartridge so when the cartridge is withdrawn from the disc drive the disc carrier is withdrawn from the disc drive along with the cartridge.

4,519,061

SEALED OPTICAL DISK UNIT, APPARATUS AND METHOD FOR DEBRIS-SUPPRESSED RECORDING

Barton E. Dahneke, Palmyra, and Alan B. Marchant, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,225
Int. Cl.³ G11B *7/24*
U.S. Cl. 369—109 **19 Claims**



1. An optical disk write/read apparatus of the kind adapted for use with a disk unit including: (i) a record element having an ablatable record portion and (ii) a cover sheet mounted in spaced relation to the record portion in a manner forming a generally enclosed space between the record element and cover sheet, said apparatus comprising:

(a) turntable means for receiving and rotating such disk unit;

(b) means for writing and/or reading ablated markings on the record portion of a received disk unit; and

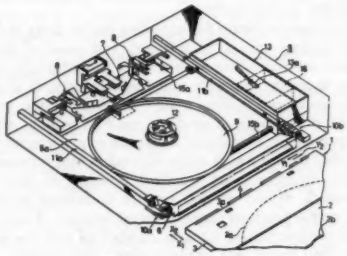
(c) means for controlling the temperature of the record element or the cover sheet of a received disk unit so that thermophoretic forces exerted by gas in its enclosed space drive ablative debris particles toward the cover sheet.

4,519,062

SIGNAL PICKUP DEVICE

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jun. 21, 1982, Ser. No. 390,737
Claims priority, application Japan, Jun. 22, 1981, 56-91895
Int. Cl.³ G11B *11/00*
U.S. Cl. 369—126 **5 Claims**



1. A signal pickup device comprising:

a single base plate;

a pickup needle for picking up an information-dependent quantity;

a transducer unit disposed adjacent to said pickup needle for converting said information-dependent quantity into an electrical signal and including an oscillator, a transformer,

a resonator and an inductor which are all fabricated on said single base plate, elongated in shape, and juxtaposed parallel to each other transversely in the order named;

a preamplifier mounted on said single base plate and positioned adjacent to and across a longitudinal end of said transducer unit; and

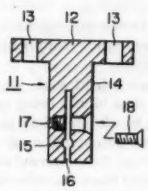
a power supply terminal disposed substantially at an interface between said transducer unit and said preamplifier for supplying electric power to said oscillator and said preamplifier.

4,519,063

PHONO PICKUP CARTRIDGE

Kazuo Nishikawa; Hiroyuki Ichino, and Keniti Okura, all of Saitama, Japan, assignors to Pioneer Electric Corporation, Japan

Filed Jun. 29, 1981, Ser. No. 278,037
Claims priority, application Japan, Jul. 1, 1980, 55-92457[U]
Int. Cl.³ G11B *3/02*
U.S. Cl. 369—172 **17 Claims**



1. A phono pickup cartridge comprising: a first body having a mount portion having at least one mount hole for mounting said first body to a pickup arm and a support portion for supporting a vibrating unit including a cantilever, said mount portion and said support portion being integral, a second hole being formed in said support portion, a vibrating supporting member being received in said second hole and being coupled to a rear end of said cantilever, a slit being provided in said support portion adjacent said second hole, and means for adjusting a width of said slit so that said vibrating supporting member can be pressingly secured in said second hole, said pickup cartridge further comprising first and second pickup coils coupled to said cantilever, and a magnet unit including a pair of magnets having like poles confronting each other, a center pole piece disposed between said like poles and first and second pole pieces disposed adjacent said magnets opposite said like poles confronting each other, said magnet unit being secured to said first body so that said center pole piece is positioned adjacent a center of said first and second pickup coils.

4,519,064

OPTICAL RECORD DISC

Toshihiko Takagi; Yoshikazu Kobayashi, both of Kawasaki; Yoshiji Suzuki, and Tsutomu Hara, both of Hamamatsu, all of Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

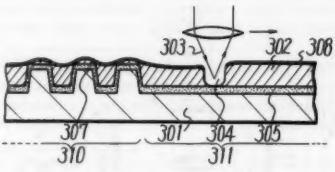
Filed Oct. 22, 1981, Ser. No. 313,764
Claims priority, application Japan, Oct. 27, 1980, 55-150382; May 21, 1981, 56-77100
Int. Cl.³ G11B *7/24*
U.S. Cl. 369—275 **8 Claims**

1. An optical record disc, comprising:

(a) a base plate having a blank portion of substantially uniform thickness and a guide signal pit portion of projections extending upwardly from one surface of said base plate;

(b) a light reflecting film layer on said one surface of said base plate coating, said blank portion and said guide signal pit portion; and

(c) a thin layer of recording material of the removing type coated on said reflection film layer, said recording material having a high light absorption factor, a substantially uniform thickness over said blank portion and a thickness over the top sections of said projections substantially smaller than over said blank portion.

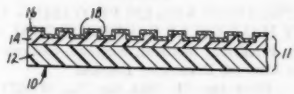


4,519,065

METALLIZED INFORMATION CARRYING DISCS

Terry W. Lewis; Roger J. Anderson, and Donald J. Kerfeld, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 189,000, Sep. 22, 1980, Pat. No. 4,363,844. This application Aug. 9, 1982, Ser. No. 406,121
Int. Cl.³ G11B *7/24;* B32B *3/02*
U.S. Cl. 369—275 **2 Claims**



1. A multilayered article for use in the manufacture of coded information bearing surfaces which may be electronically decoded comprising:

(a) a base having at least one surface which is a layer of a thermoplastic, radiation curable polymeric resin, wherein said layer of polymeric resin exhibits a maximum loss modulus which appears between 30° and 180° C.,

(b) an embossable electrically conductive or electromagnetic radiation reflective layer over said at least one surface,

said embossable layer comprising metal having a thickness in the range of 0.2 to 60 nm.

4,519,066

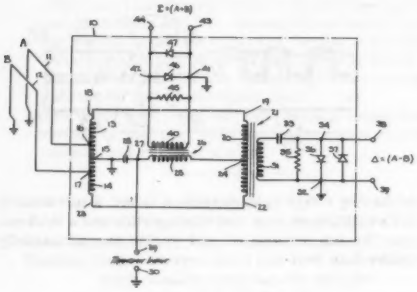
DUPLEXER WITH SUM AND DIFFERENCE SIGNAL OUTPUTS

Raymond L. Barrett, Jr., Oakland Park, Fla., and Thomas A. O. Gross, Lincoln, Mass., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Dec. 6, 1982, Ser. No. 447,221
Int. Cl.³ H04B *5/02*
U.S. Cl. 370—24 **6 Claims**

1. A duplexer for use in a signalling system wherein a first signal is to be transmitted in one direction through first and second coupling devices, and a second signal, distinguishable from said first signal, is to be received in the opposite direction through said coupling devices for communication to a first and second output, respectively, as the algebraic sum and difference of the separate components of said second signal that are received, respectively, through each of said coupling devices, said duplexer comprising in combination first and second transformation means for converting separate single ended transmission paths to one double ended path, means for coupling

said double ended path to said second output, means for coupling said first and second transformation means in parallel to said first output, means for coupling said first signal in parallel to said transformation means, means for coupling each of said



coupling devices to said transformation means for providing separate single ended transmission paths to said transformation means, and means for limiting the absorption of power from said first signal by said first output.

4,519,067

COMMUNICATION SYSTEM PROVIDING AMPLIFIER GAIN BY HALF-CYCLE CARRIER SIGNAL CONTROL

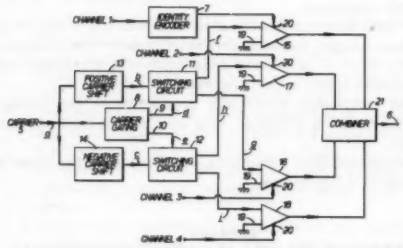
Douglas S. Friedrich, Benfleet, England, assignor to Marconi Avionics Limited, Rochester, England

Filed Apr. 21, 1983, Ser. No. 487,027

Claims priority, application United Kingdom, Apr. 22, 1982, 8211655

Int. Cl.³ H04J *7/02, 3/02*

U.S. Cl. 370—78 **4 Claims**



1. A communication system including means for transmitting a plurality of information channels on a single carrier signal by arranging that the amplitudes of predetermined half-cycles of one polarity of the carrier signal relate to one of said channels, and that the amplitudes of predetermined half-cycles of the other polarity of the carrier signal relate to another of said channels, said transmitting means including means for shifting the level of selected cycles of said carrier signal by a polarity which depends on the polarity of the predetermined half-cycles, a plurality of amplifiers connected to receive respective level shifted half-cycles of the carrier signal, wherein signals relating to each of said information channels are utilized to alter the gain of respective ones of said amplifiers so as to control the amplitudes of corresponding level shifted half-cycles of the carrier signal which are applied to said amplifiers, and receiving means for receiving the carrier signal and for reconstituting the plurality of information channels.

4,519,068

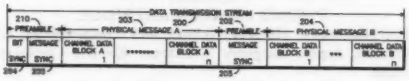
METHOD AND APPARATUS FOR COMMUNICATING VARIABLE LENGTH MESSAGES BETWEEN A PRIMARY STATION AND REMOTE STATIONS OF A DATA COMMUNICATIONS SYSTEM

Jay Krebs, Crystal Lake, and Thomas A. Freeburg, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 11, 1983, Ser. No. 512,801

Int. Cl.³ H04J *3/16*

U.S. Cl. 370—82 **10 Claims**



1. A signalling system for communicating messages via a communications medium between a primary station and a plurality of remote stations in a data communications system, said signalling system including a variable length message which is transmitted between an originating station and received by at least one destination station and is comprised of:

a bit synchronization field;

a message synchronization field; and

a plurality of channel data blocks being comprised of:

said first channel data block including: an information field including at least one command, a station address and a check word coded from the command and station address; and a parity field coded from the information field according to a predetermined code; the bits of the fields being interleaved such that consecutive bits of a field are separated by a predetermined number of bits;

said second channel data block including: an information field including a block count; a message sequence number incremented for each message and a check word coded from the block count and message sequence number; and a parity field coded from the information field according to a predetermined code; the bits of the fields being interleaved such that consecutive bits of a field are separated by a predetermined number of bits; and

said third and following channel data blocks each including: an information field including data; and a parity field coded from the information field; the bits of the fields being interleaved such that consecutive bits of a field are separated by a predetermined number of bits; and the information field of the last channel data block further including a check word coded from the data in the information field of the third and following channel data blocks.

4,519,069

COMMUNICATION SYSTEM INTERCONNECTING RADIOS AND OPERATORS LOCATED AT DIFFERENT POSITIONS

David G. Pudsey, Rayleigh, England, assignor to GEC Avionics Limited, Rochester, England

Filed Oct. 27, 1982, Ser. No. 437,165

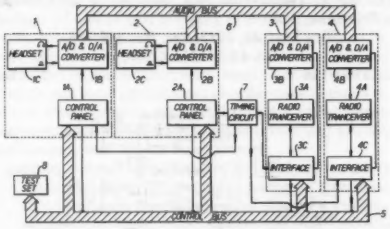
Claims priority, application United Kingdom, Oct. 28, 1981, 8132436

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—85 **7 Claims**

1. A communication system for interconnecting radios, each able to provide at least one radio facility, and operators located at different positions, the system comprising: a control bus and an audio bus for interconnecting the operator positions and the radios, means at each operator position for applying, in turn to the control bus, a request code constituting a request for a particular radio facility, means associated with each radio for responding to receipt of a request code by applying to the control bus an availability code indicating the radio's availabil-

ity for providing the said facility, means at each operator position for applying to the control bus an instruction code instructing a particular radio to provide a facility requested



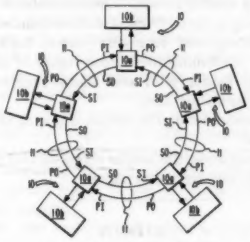
and for connecting the operator position to a particular channel of the audio bus, and means at the said particular radio for providing the requested facility on the said particular channel of the audio bus.

4,519,070

METHOD OF INITIALIZING AND RECOVERING FROM FAILURES IN A LOCAL AREA NETWORK

John L. Bell, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 19, 1984, Ser. No. 571,928
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—88 **11 Claims**



1. A method of operating a station having two input-output ports for coupling said station to two other stations in a communication network; said method including the steps of:

monitoring the input section of one port in said station to detect an idle signal, a delimiter signal, or silence thereon;

transmitting said idle signal from the output section of said one port if silence is detected by said monitoring step;

sending said delimiter signal from the output section of said one port if said idle signal is detected by said monitoring step; and

coupling internally in said station the input section of said one port to an output section of either said one port or the other port of said station in a predetermined fashion to permit signals on the input section of said one port to pass through said station if said delimiter signal is detected by said monitoring step.

4,519,071

PHASE-LOCKED LOOP AND CLOCK CIRCUIT FOR A LINE SWITCH

Robert L. Miller, Westerville, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,602
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—100 **21 Claims**

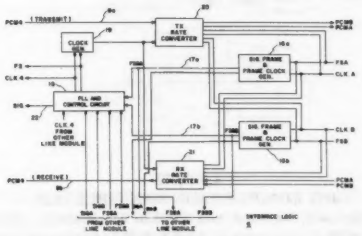
1. A circuit arrangement responsive to an input signal of a first frequency at a first terminal for generating output signals of a second frequency and having a predetermined phase relationship to said input signals at a second terminal, said circuit arrangement comprising:

a voltage controlled oscillator having an output coupled to said second terminal and having a control input, said voltage controlled oscillator generating a signal having a frequency dependent on the voltage level at said control input;

means coupled to said voltage controlled oscillator output for supplying feedback signals; and

first means responsive to said input signals and said feedback signals for supplying said voltage level, said first means comprising:

a controlled voltage source for generating said voltage level in response to first and second control signals, said controlled voltage source being responsive to said first control signal to change said voltage level in a first direction and being responsive to said second control signal to change said voltage level in a second direction opposite said first direction; and



detection means for generating said first and second control signals in response to said input signals and said feedback signals, said detection means having a first stable state whereby neither said first nor said second control signals are generated, a second stable state whereby only said first control signal is generated, and a third stable state whereby said second control signal is generated, said detection means normally being in said first stable state, said detection means assuming said second stable state each time said input signal occurs prior to said feedback signal and remaining in said second stable state for substantially the time difference between the occurrences of said input signal and said feedback signal, said detection means returning to said first stable state from said second stable state after the occurrence of said feedback signal, said detection means assuming said third stable state each time said feedback signal occurs prior to said input signal and remaining in said third stable state for substantially the time difference between the occurrence of said feedback signal and said input signal, said detector means returning to said first stable state from said second stable state after the occurrence of said input signal.

4,519,072

ANSWER SUPERVISION SYSTEM

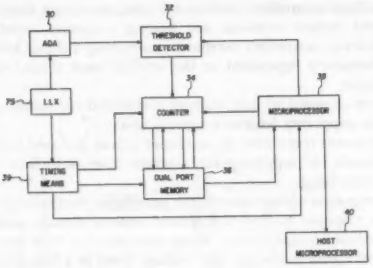
William A. Fechalos, Naperville, and Joseph M. DeMarco, Elmhurst, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 10, 1982, Ser. No. 440,690
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—110.1 **14 Claims**

1. In a telecommunication supervision system for evaluating the status of an input signal from a communication channel, said signal having one of a plurality of different cadences, the system comprising:

detection means receiving the input signal from the communication channel and outputting channel signal when the

input signal has an energy level exceeding a threshold reference; and



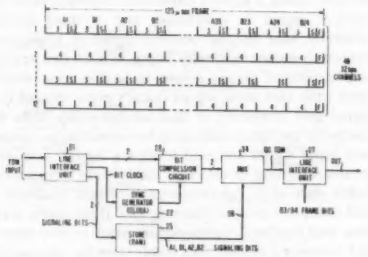
means for analyzing periods between interruptions of said output signal to determine the identity of the particular cadence of the input signal.

4,519,073

BIT COMPRESSION MULTIPLEXER

Guido Bertocci, Neptune, and Stephen M. Walters, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1983, Ser. No. 505,926
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—118 **8 Claims**



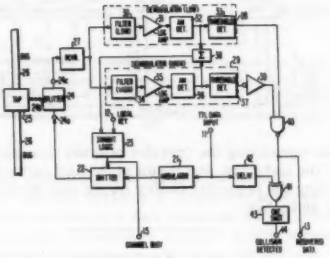
1. A bit compression multiplexing system (FIG. 2) for a pair of time division multiplexed digital bit streams each of which includes a plurality of PCM encoded signals deposited in separate and distinct channels of a repetitive frame and signaling bits multiplexed therewith comprising means (23) for normally bit compressing the PCM encoded signals of successive frames into n-bit signals and periodically bit compressing a frame of said encoded signals into (n−1) bit signals, means (21) for extracting the signaling bits from the pair of digital bit streams, and multiplex means (24) for time division muotiplexing the bit compressed signals of the pair of bit streams so that the multiplexed compressed signals occupy separate and distinct channels of a repetitive frame, said multiplex means also serving to insert the extracted signaling bits into predetermined (n−1) bit channels of the last-recited repetitive frame, the signaling bits placed in a given channel being related to the encoded message signal of that channel.

4,519,074

TRANSCEIVER HAVING COLLISION DETECTION CAPABILITY FOR CONTENTION-FORMATTED FDM LOCAL AREA NETWORKS

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1983, Ser. No. 499,796
Int. Cl.³ H04J *6/00*
U.S. Cl. 370—124 **27 Claims**



1. An apparatus for transmitting RF modulated signals onto a communications medium and for receiving RF modulated signals from said communications medium, said apparatus including:

means for frequency modulating a baseband signal;

means for transmitting the output signal of said frequency modulating means to said communications medium and for receiving a signal from said communications medium;

said transmitting and receiving means further including means for combining the output signal of said frequency modulating means with said signal received from said communications medium;

means for demodulating the output signal of said combining means; and

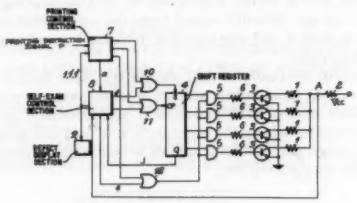
means for comparing the output signal of said demodulating means with said baseband signal.

4,519,075

DEVICE FOR CHECKING THE PRINTING CIRCUIT OF A THERMAL PRINTER

Hatsuo Kawaguchi, Kurita, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Aug. 12, 1982, Ser. No. 407,327
Claims priority, application Japan, Aug. 12, 1981, 56-127144
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—15 **8 Claims**



1. A device for checking the printing circuit of a thermal printer which includes a plurality of heaters arranged in a predetermined pattern on a thermal print head for printing print data; a power supply resistor connected between one end of said heaters and a source of current for supplying heating current to said heaters; a plurality of driver transistors each in operable connection with another end of said heaters and a ground, for selectively conducting heating current through

said heaters; a shift register for providing parallel print data output signals to be printed by said thermal print head as said print data; and a plurality of logic gate circuits each in operable connection with individual parallel data output terminals of said shift register and, through current limiting resistors, with the base of one of said plurality of driver transistors for selectively transferring said print data output signals to be printed from said shift register to the bases of said plurality of driver transistors in accordance with head control pulse signals applied to said logic gate circuits in order to selectively cause said driver transistors to conduct heating current through said heaters to print said print data on thermal paper in contact with said heaters; said device comprising:

printing control circuit means for applying serial print data input signals corresponding to said print data to be printed to a serial data input terminal of said shift register and for applying said head control pulse signals to said plurality of logic gate circuits, said serial print data input signals and said head control pulse signals being applied, respectively, at suitable times for causing said print data to be normally printed;

self-examination control circuit means for applying serial checking data signals to said serial data input terminal of said shift register and for applying head control pulse signals to said plurality of logic gate circuits so as to check the level of a potential at a circuit connection point between said power supply resistor and said heaters so as to judge whether or not said heaters and said driver transistors are in good condition, said head control pulse signals having such a short pulse duration time as not to effect color development or printing, while detecting serial output data signals from a serial data output terminal of said shift register so as to judge whether said shift register is in good operating condition;

defect display circuit means for indicating a defect condition detected by said self-examination control circuit means;

first OR gate logic circuit means in operable connection with said printing control circuit means, said self-examination control circuit means and said serial data input terminal of said shift register for transferring said serial print data input signals from said printing control circuit means or said checking data signals from said self-examination control circuit means to said serial data input terminal of said shift register;

second OR gate logic circuit means in operable connection with said printing control circuit means, said self-examination control circuit means and said shift register for transferring shift pulse signals from said printing control circuit means of said self-examination control circuit means to a shift pulse terminal of said shift register; and

third OR gate logic circuit means in operable connection with said printing control circuit means, said self-examination control circuit means and said plurality of logic gate circuits for transferring head control pulse signals from said printing control circuit means or said self-examination control circuit means to said plurality of logic gate circuits.

4,519,076

MEMORY CORE TESTING SYSTEM

Ury Priel; Giora Yaron, both of Cupertino, and Mark S. Ebel, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 28, 1981, Ser. No. 334,699
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—21 **7 Claims**

1. Apparatus to gain direct access to current carrying portions of a non-volatile electrically alterable read only memory to permit testing of the memory core to determine the current flow of said current carrying portions, said apparatus comprising:

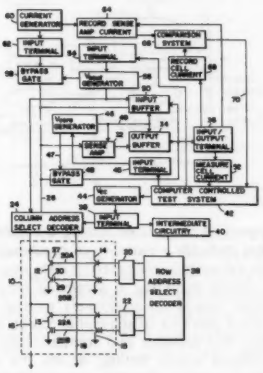
an electrical connection terminal on the memory;

an addressable memory core on the memory;

current conditioning buffer means connected between said terminal and said memory core so as to permit efficient electrical communication with said memory core;

a first bypass gate connected between said terminal and said memory core:

first bypass signal generating means operable in response to the application of a predetermined first access signal to disable said current conditioning buffer means and enable first bypass gate so as to permit current flow directly from said memory core to the terminal;



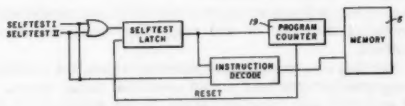
a computer controlled test system external to said memory and connected to said terminal and said first generating means, said test system operable to provide said predetermined first access signal to said first generating means and further operable to measure the current flow from said memory core, through said first bypass gate and said terminal.

4,519,077

DIGITAL PROCESSING SYSTEM WITH SELF-TEST CAPABILITY

Pravin T. Amin, 7414 Dew Mist La., Houston, Tex. 77095

Filed Aug. 30, 1982, Ser. No. 412,640
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—21 **12 Claims**



1. A digital processing system comprising:

a memory means for the storing of words containing data and instructions that define operations on said data, each word contains M binary digits;

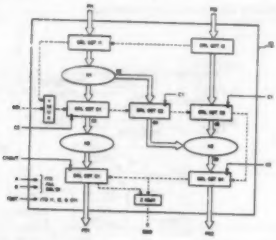
an N (where N is less than M) binary digit parallel arithmetic and logic unit connected to said memory means and for performing said operations; and

self-test means connected to said memory means and said arithmetic and logic means for summing the numeric value of the contents of said memory means into a plurality of binary digital sums and comparing said sums with corresponding constants, said self test means includes: first self test means for controlling the testing of a first portion of the M binary digits, second self test means for controlling the testing of a second portion of the M binary digits, and accumulator means for accumulating the results of the testing of the first and second portions.

4,519,078
LSI SELF-TEST METHOD

Donald Komonytsky, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 29, 1982, Ser. No. 426,451
Int. Cl.³ G01R 31/28
U.S. Cl. 371—25 **15 Claims**



1. An improved method of testing a combination of logic elements that includes a plurality of combinational networks, input means for selectively entering data into said networks, said input means including a group of input shift register latches, output means for selectively exiting data from said networks, and a plurality of sequential circuit means for selectively passing data between said combinational networks, said sequential circuit means having access for selectively and independently scanning data therethrough, said method comprising the steps of:

(a) isolating all of said sequential circuit means into a plurality of sets of sequential circuits, at least one set being associated with each of said combinational networks;

(b) internally generating a data test pattern by:

(1) selectively configuring a plurality of said input shift register latches into a feedback shift register having at least one logic gate in its feedback path that combines the outputs of a plurality of said shift register latches with an exclusive-or function,

(2) initializing each of the shift register latches of said feedback shift register to a prescribed state; and

(3) clocking said feedback shift register so as to produce a serial pseudorandom test pattern;

(c) scanning said test pattern into said sequential circuit means through said scanning access;

(d) applying said test pattern to at least one of said combinational networks through said input means so that an output response pattern is obtained;

(e) clocking said output response pattern of said combination network into one of said respective sequential circuit means;

(f) scanning out, through said scanning access, the resulting response patterns held in said sequential circuit means;

(g) analyzing said response pattern for an indication of the test status of the combinational networks tested; and

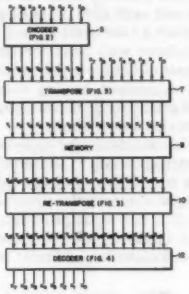
(h) repeating steps (b) through (g), as desired, until all of the combinational networks have been tested.

4,519,079
ERROR CORRECTION METHOD AND APPARATUS

Howard Hamer, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1983, Ser. No. 467,551
Int. Cl.³ G06F 11/10
U.S. Cl. 371—38 **9 Claims**

1. Error correction circuitry comprising means to generate a redundant byte, y_7-y_0, for each original byte, x_7-x_0, by modulo 2 addition of adjacent pairs of bits of said original byte, means to store both said original and redundant bytes in memory, means to recall said original and redundant bytes from memory, said recalled original and redundant bytes being represented as $x_{a7}-x_{a0}$ and $y_{a7}-y_{a0}$, respectively, means to apply said recalled original and redundant bytes to two arrays of modulo 2 adders to obtain two new bytes represented as $x_{b7}-x_{b0}$ and $x_{c7}-x_{c0}$, wherein $x_{bn}=x_{a(n+1)}\oplus y_{an}$, and

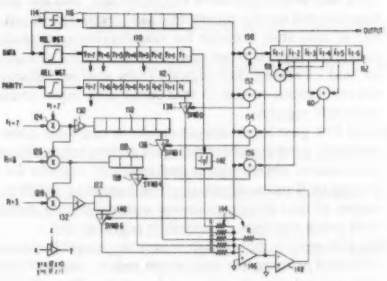


$x_{cn}=x_{a(n-1)}\oplus y_{a(n-1)}$, and means to apply corresponding bits of said new bytes and said recalled original byte to one of an array of majority vote circuits, whereby the output of said array of majority vote circuits comprises the corrected code.

4,519,080
ANALOG THRESHOLD DECODER

John S. Snyder, Jr., Monrovia, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,600
Int. Cl.³ G06F 11/10
U.S. Cl. 371—43 **18 Claims**



1. A threshold decoder of the type wherein a sequence of information and parity signals are received, wherein said information signals are hard-detected and each information signal is then decoded in accordance with a decision signal to obtain a respective digital decoded information signal, said decoder comprising:

first digital storage means for storing a sequence of first digital signals resulting from hard-detection of said received information signals, said first digital signals representing information signals yet to be decoded including an information signal currently being decoded;

second digital storage means for storing a sequence of digital decoded information signals;

means responsive to said received information signals for providing analog values representing the value and reliability of said received information signals represented in said first digital storage means;

means responsive to said received parity signals for providing analog values representing said received parity signals;

first analog storage means for storing said analog values

representing the value and reliability of said received information signals represented in said first digital storage means and for storing said analog values representing received parity signals;

syndrome means for generating syndrome analog signals from combinations of signals of said first analog storage means and said second digital storage means;

decision means for combining a plurality of decision input signals and for generating a decision signal in accordance with the combination of said plurality of decision input signals, said decision input signals including a plurality of said syndrome signals; and

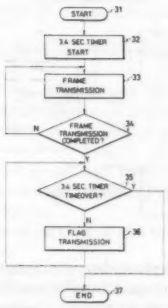
decoding means responsive to said generated decision signal for decoding said information signal currently being decoded to provide a digital decoded information signal.

4,519,081

FACSIMILE COMMUNICATION METHOD WITH ANTI-ECHO STRATEGY

Masatoshi Sugie, Zama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 29, 1982, Ser. No. 393,304
Claims priority, application Japan, Jun. 29, 1981, 56-102063
Int. Cl.³ H04M *1/36*
U.S. Cl. 371—57 **5 Claims**



1. A facsimile communication method for preventing receipt of an echo of data being transmitted by ensuring that an echo returns only while transmission of data is in progress, said method being for transmitting and receiving data in the form of preamble-preceded frames in which a frame is allowed to be received only when its preceding preamble has been received prior thereto, said method comprising the steps of:

transmitting a preamble-preceded frame and at the same time measuring a time length of transmitting said preamble-preceded frame;

comparing the measured time length of transmitting said preamble-preceded frame with a predetermined time length when said transmitting step is completed; and

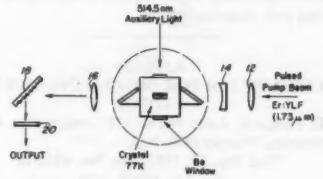
adding one or more flags to the end of said preamble-preceded frame until the frame time length exceeds the predetermined time length only when said measured time length is shorter than said predetermined time length, thereby preventing an echo of said preamble-preceded frame from being received.

4,519,082

COLOR CENTER LASER, MATERIAL, AND METHOD OF LASING

Irwin Schneider, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1982, Ser. No. 356,863
Int. Cl.³ H01S *3/16*
U.S. Cl. 372—42 **18 Claims**



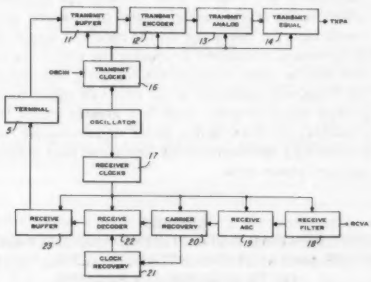
1. A laser material for a solid-state tunable laser which comprises a potassium or rubidium halide crystal having a lithium and/or sodium cation impurity, said crystal having a crystalographic structure with point defects consisting essentially of F_2^+ and $(F_2^+)_A$ color centers and electron traps, said F_2^+ and $(F_2^+)_A$ color centers being present in concentrations sufficient to obtain lasing from two types of color centers and said electron traps being present in a concentrations sufficient to prevent bleaching of said color centers.

4,519,083

BILATERAL DIGITAL DATA TRANSMISSION SYSTEM

Kerry A. Hanson, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,559
Int. Cl.³ H04L *27/18*
U.S. Cl. 375—9 **37 Claims**



1. A bilateral digital data communication system for originating digital signals and for transmitting PSK modulated signals representative thereof on a first carrier frequency over a first transmission line, and for receiving PSK modulated signals on a second carrier frequency over a second transmission line, and for conversion to digital signals representative thereof, comprising:

(a) digital data originating and receiving means;

(b) PSK modem transmit encoding means connected to receive digital data from the digital data originating and receiving means for encoding digital data into a first format for conversion to corresponding PSK signals;

(c) PSK modem transmit modulating means, implemented in switched capacitor circuitry and connected to receive the first format for phase modulating the first carrier fre-

quency according to the first format to provide corresponding PSK signals;

(d) PSK modem receive demodulating means, implemented in switched capacitor circuitry, for demodulating the PSK signals on the second carrier frequency to provide PSK signals in a second format for conversion to corresponding digital signals; and

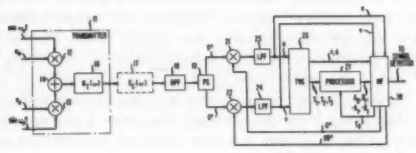
(e) PSK modem receive encoding means connected to receive the second format for encoding the second format into corresponding digital signals and connected to send the corresponding digital signals to the digital data originating and receiving means.

4,519,084

MATCHED FILTER FOR COMBATING MULTIPATH FADING

Rollin E. Langseth, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 29, 1982, Ser. No. 426,816
Int. Cl.³ H04B *3/06*
U.S. Cl. 375—14 **10 Claims**



1. Apparatus for combating phase error introduced by a transmission path on a received signal, the apparatus using a prescribed power series mathematical model of the transmission path to reduce the effect of phase error, the apparatus comprising:

characterizing means for generating an output of test variables using components of the received signal and a derivative of each component;

processing means for mathematically manipulating the test variables in accordance with relationships expressing the power series mathematical model to produce weighting coefficients for operating on the received signal; and

filtering means, connected to receive the weighting coefficients and the signal components, for using those portions of the frequency spectrum of the received signal having the greater signal-to-noise ratio to a greater extent than the remaining portions having lesser signal-to-noise ratios for producing a recovered clock signal and data outputs with reduced phase error.

4,519,085

DIFFERENTIAL DATA CODING AND DECODING PROCESS AND SYSTEM RESTRICTING PROPAGATION OF TRANSMISSION ERRORS

Jean Y. Catros, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 27, 1982, Ser. No. 423,726
Claims priority, application France, Oct. 27, 1981, 81 20167
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—27 **8 Claims**

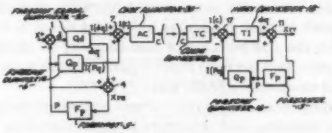
1. A differential digital data coding-decoding process reducing propagation of transmission errors, comprising the steps of:

(A) coding a signal to be transmitted, said coding including the steps of :

(a) quantizing a forecasting error between a digital quantity to be coded, and a forecast value of said digital quantity, calculated on the basis of reconstructed previous values of said digital quantity, (b) quantizing the forecast value and (c) assigning a code word, selected from 2^k (where k is an integer) code words, to the quantized forecasting error, the code word being based at least in part on the quantized forecast value,

(B) transmitting the assigned code word, and

(C) receiving the transmitted code word and, decoding it, the decoding including the steps of (a) deducing from the code word received the corresponding forecast error and forecast value, then (b) deducing the corresponding reconstructed



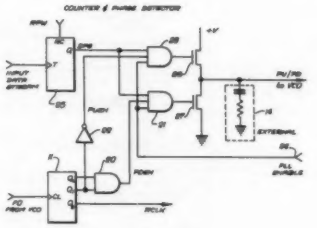
value for a forecast calculated in substantially the same way as for coding, from reconstructed previous values, the forecasting error being calculated during decoding, on the basis of the quantized forecast, a transmission error which during decoding causes an error in a corresponding quantized forecast value for a following value being compensated for calculation of the forecasting error, which takes this quantized forecast into account.

4,519,086

MOS PHASE LOCK LOOP SYNCHRONIZATION CIRCUIT

Richard W. Hull, Mission Viejo, and Leonard Teslenko, Fountain Valley, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 16, 1982, Ser. No. 388,899
Int. Cl.³ H03L *7/06*
U.S. Cl. 375—120 **2 Claims**



1. An improved phase detector circuit comprising:

(a) a variable voltage controlled oscillator having a variable resistance means for varying the frequency of the oscillator output signal in response to a voltage correction signal;

(b) counter means for receiving the output signal from the oscillator, for generating during each four clock cycles of the oscillator output signal a first phase detection enable signal during every fourth clock cycle, and a second phase detection enable signal during every first and second clock cycles, and further for generating a clock output;

(c) a signal shaping means for receiving a data input signal of approximately the same frequency as the clock output of the counter means and for generating an approximately uniform width data output signal;

(d) a first logical AND gate means for receiving the data output signal and the first phase detection enable signal and generating a first phase difference signal;

(e) a second logical AND gate means for receiving the data output signal and the second phase detection enable signal and generating a second phase difference signal; and

(f) a switchable voltage pulse generator comprising first and second transistor means in series coupled respectively to the output of said first and second logical AND gates, with the junction of the first and second transistors being

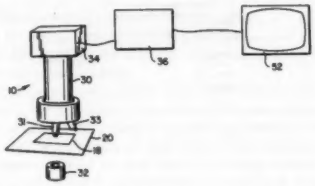
coupled to the variable resistance means of the oscillator, for generating and transmitting a voltage correction signal to the variable resistance means of the oscillator in response to the presence of the first or second phase difference signals, wherein the voltage correction signal causes the variable resistance means to change the frequency output of the variable voltage controlled oscillator, thereby causing the clock output of the counter means to become synchronized with the frequency of the input data signal.

4,519,087

METHOD OF DETERMINING THE DIAGNOSTIC SIGNIFICANCE OF THE CONTENT OF A VOLUME OF BIOLOGICAL SAMPLE CONTAINING PARTICLES

Fred H. Deindoerfer, Northridge, Calif., assignor to International Remote Imaging Systems, Inc., Chatsworth, Calif.

Filed Jun. 20, 1983, Ser. No. 505,908
Int. Cl.³ G01N *33/48*
U.S. Cl. 377—10 **3 Claims**



1. A method of determining the diagnostic significance of the content of a volume of biological sample containing particles, said method comprising the steps of:

(a) distributing an aliquot of said sample over an extended area;

(b) examining the aliquot under low resolution by a first microscopic means;

(c) forming an optical still image of said extended area;

(d) converting said optical image to an electronic image;

(e) electronically counting the number of particles in said electronic image;

(f) repeating the steps of (a)–(e) until the number of aliquot examined under low resolution equals a first a priori determined number of aliquots;

(g) totalling the number of particles in said aliquots examined under low resolution;

(h) comparing said number of particles totalled to a first a priori determined number of particles;

(i) terminating said method, upon said comparison of the content of said volume of biological sample being diagnostically insignificant; otherwise

(j) continuing said method based upon said comparison;

(k) distributing an aliquot of said sample over an extended area;

(l) examining the aliquot under high resolution by a second microscopic means;

(m) forming an optical still image of said extended area;

(n) converting said optical image to an electronic image;

(o) electronically counting the number of particles in said electronic image;

(p) repeating the steps of (k)–(o) until the number of aliquots examined under high resolution equals a second a priori determined number of aliquots;

(q) totalling the number of particles in said aliquots examined under high resolution;

(r) comparing said number of particles totalled to a second a priori determined number of particles;

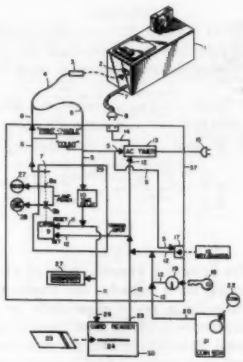
(s) determining the diagnostic significance of the content of said biological sample based upon said comparison.

4,519,088

USAGE CONTROL SYSTEM

Darrell Rademacher, Freeville; Thomas Neville, Dryden, both of N.Y., and Roger T. Simpson, 365 E. King Rd., Ithaca, N.Y., assignors to XCP, Inc., Dryden, N.Y., by said Darrell Rademacher and Thomas Neville

Filed Aug. 3, 1982, Ser. No. 404,754
Int. Cl.³ G06M *3/02*; G07F *5/10, 7/02*
U.S. Cl. 377—16 **11 Claims**



1. A usage control system for electrically powered machines for performing a function, such as copiers or the like, said machine requiring a first signal to initiate the desired function, and emitting a second signal related to the performance of the function; said machine having socket means for interconnection of external equipment giving access to at least said first and second signals; said machine being enabled to perform its function upon receipt of the first signal, and emitting the second signal on or before completion of the function; the system comprising:

a. plug means for interconnection of external equipment adapted to mate with said socket means;

b. control means, conductively attached to the plug means by a cable means having at least a first set of conductors for conveying the first signal from the control means to the machine through the plug socket means; and a second set for conveying the second signal from the machine to the control means through the socket and plug means; the control means comprising:

1. latch means having a first latched and second unlatched state, a set input causing the latch means to assume the latched state, a reset input causing the latch means to assume the unlatched state, and an output connected to the first set of conductors in the cable means whereby the first signal is sent to the machine when the latch means is in the latched state;

2. trigger input means connected to the set input of the latch means, whereby a signal at the trigger input means causes the latch means to assume the latched state;

3. delay timer means having an input connected to the second set of conductors of the cable means and a delayed output connected to the reset input of the latch means, said delayed output being adapted to apply a signal to the said reset input, causing the latch means to assume the unlatched state, said delay being chosen to be a period of time after receiving the second signal from the machine sufficient to permit the machine to complete a single incompleted function cycle;

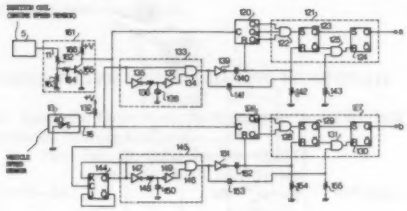
c. check-operated means having an output adapted for activating the trigger input means of the control means in response to entry of a check by user.

4,519,089

SYSTEM FOR DETECTING NEUTRAL STATE OF A TRANSMISSION OF AN ENGINE FOR VEHICLES

Kazuo Hara, Musashino, and Kunihiro Abe, Higashimurayama, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 334,057
Claims priority, application Japan, Dec. 27, 1980, 55-187175
Int. Cl.³ G07C *1/00*
U.S. Cl. 377—16 **7 Claims**



1. A system for detecting a neutral state of a transmission for an engine mounted on a vehicle, the transmission having a plurality of transmission ratios dependent on change speed gears of said transmission, the system comprising

an engine speed detecting means for producing an engine speed output in proportion to the engine speed;

a vehicle speed detecting means for producing a vehicle speed output in proportion to the vehicle speed;

an operation circuit means for judging whether the ratio of said engine speed output to said vehicle speed output is in a range of the transmission ratios dependent on said transmission;

said operation circuit means producing at least one neutral state output when said ratio is outside of said range of said transmission ratios, thereby detecting the neutral state of the transmission,

said engine speed detecting means produces output pulses and said vehicle speed detecting means produces output pulses,

said operation circuit means comprises,

counter means for counting said output pulses from one of said detecting means and for producing a first signal when counting a predetermined number of the pulses before said counter means is reset,

first circuit means responsive to each of said output pulses from the other detecting means for producing a second signal for resetting said counter means thereby determining a respective period of operation of said counter means, and

second circuit means including gate means responsive to said first and second signals for producing said neutral state output in dependency on the result of said counting during said period.

4,519,090

TESTABLE TIME DELAY

Kenneth B. Stackhouse, and William D. Hill, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 27, 1982, Ser. No. 402,323
Int. Cl.³ G06F *11/00*; G06M *3/02*
U.S. Cl. 377—29 **2 Claims**

1. A self-testing apparatus for generating time delays comprising:

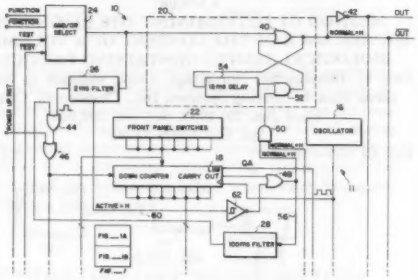
an input select circuit for receiving function input signals and test signals;

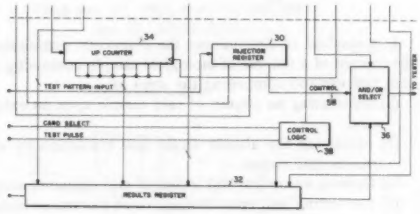
time delay generating means comprising a latchable flip-flop for generating an output signal at a preselected time delay in response to an input signal from said select circuit, said flip-flop including latch inhibiting means for preventing a stable state change in response to input signals of a duration shorter than a preselected interval;

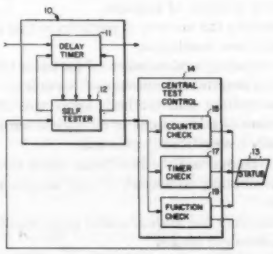
an oscillator providing a continuous series of clock pulses;

a first counter connected to receive said clock pulses to provide a count thereof, said first counter having reset input;

a second counter connected to receive said clock pulses to provide a count thereof, said second counter having a reset input, said second counter being incremented in a sense opposite to said first counter;







a counter reset circuit for applying said input signals to said reset inputs of said first and second counters and a feedback circuit from an output of said first counter to said counter reset circuit including a low pass filter for inhibiting application of input signals of less than a predetermined duration to said reset inputs of said first and second counters;

an injection register for receiving a pattern of test signals and for applying said test signals to said input select circuit; and

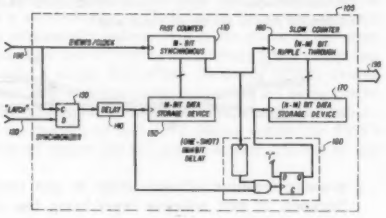
a results register connected to said first and second counters for comparing the counts therein.

4,519,091

DATA CAPTURE IN AN UNINTERRUPTED COUNTER

David C. Chu, Woodside, and Michael J. Ward, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1983, Ser. No. 519,953
Int. Cl.[3] H03K *21/18, 21/34, 21/10*
U.S. Cl. 377—44 7 Claims



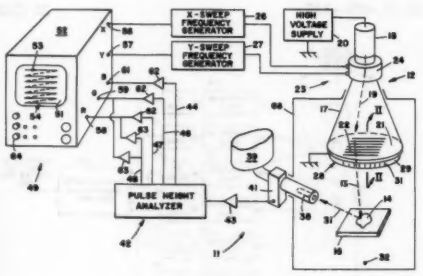
1. An N-bit counting apparatus comprising:
an M-bit low-order synchronous counter;
an (N-M)-bit high-order counter coupled to said synchronous counter in tandem;
first storage means coupled to said synchronous counter for capturing the contents of said synchronous counter;
second storage means coupled to said high-order counter for capturing the contents of said high-order counter; and
delay means coupled to said second storage means to prevent capturing for a predetermined period in response to the most significant bit from said synchronous counter.

4,519,092

SCANNING X-RAY SPECTROMETRY METHOD AND APPARATUS

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Filed Oct. 27, 1982, Ser. No. 437,037
Int. Cl.[3] G01N *21/24, 23/20*
U.S. Cl. 378—045 10 Claims



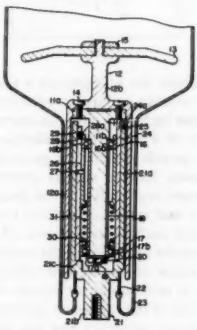
1. In an x-ray spectrometer for detecting the distribution of at least one chemical element within an object and having scanning means for directing primary x-rays to successive points situated along a scan path on said object, detector means for detecting fluorescent x-rays emitted from said object in response to said primary x-rays, and means for detecting variations of the amount of said element along said scan path by analyzing the energy of said fluorescent x-rays the improvement comprising:
said scanning means having a charged particle beam source, a target plate formed of material which produces x-rays in response to said charged particle beam, and beam deflector means for establishing a varying electrical and/or magnetic field in the path of said charged particle beam to sweep said charged particle beam along an impact path on said plate which corresponds to said scan path on said object, and
means for suppressing detection of said primary x-rays by said detector means.

4,519,093

ROTARY ANODE X-RAY TUBE

Teruo Kurihara, and Takeshi Oowa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 290,306, Aug. 5, 1981,. This application Feb. 21, 1984, Ser. No. 580,298
Claims priority, application Japan, Aug. 19, 1980, 55-113031
Int. Cl.[3] H01J *35/04*
U.S. Cl. 378—132 7 Claims

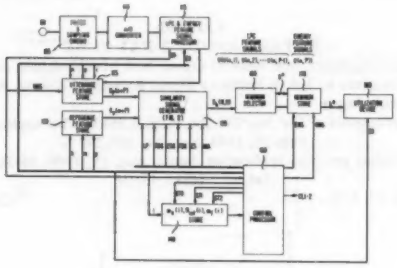


1. A rotary anode X-ray tube comprising:
a bulb;
a support frame having a shaft portion and disposed inside said bulb;
a rotary anode fixed to the shaft portion of said support frame;
a rotating shaft attached to said support frame coaxially with said shaft portion;
a support member having a cylindrical portion concentrically surrounding said rotating shaft at a given space therefrom wherein said support member is constructed of a soft material which is subject to deformation at normal operating temperatures of said tube;
an auxiliary tube concentrically disposed between said rotating shaft and said cylindrical portion and fixed to said cylindrical portion wherein said auxiliary tube is constructed of a material which is hard relative to said material of said support member and wherein said material of said auxiliary tube is not subject to deformation at normal operating temperatures of said tube;
first and second bearings concentrically disposed between said auxiliary tube and said rotating shaft at given spaces therefrom, each said bearing having an inner race located on the rotating shaft side and an outer race located on the auxiliary tube side wherein the outer circumferential surface of said outer race of each bearing abuts on the inner circumferential surface of said auxiliary tube so that both said bearings are concentrically supported by said auxiliary tube;
an urging means for elastically pressing one race of at least one of said bearings along said rotating shaft; and
a means for fixing the other race of said one bearing.

4,519,094
LPC WORD RECOGNIZER UTILIZING ENERGY FEATURES

Michael K. Brown, Piscataway, and Lawrence R. Rabiner, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1982, Ser. No. 411,834
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **18 Claims**



1. A speech analyzer for recognizing a speech pattern comprising: means for storing a plurality of reference pattern templates, each template including a time frame sequence of acoustic feature signals of a prescribed reference pattern; means responsive to the speech pattern for generating a time frame sequence of acoustic feature signals corresponding to said speech pattern; means responsive to the feature signals of said speech pattern and said reference pattern templates for generating a set of signals each representative of the similarity between the feature signal sequence of the speech pattern and the feature signal sequence of one of said reference patterns; and means responsive to said similarity signals for identifying the speech pattern as one of the reference patterns; said prescribed reference feature signal sequence and said speech pattern feature signal sequence each comprising at least a time frame sequence of predetermined type acoustic spectral feature signals and a time frame sequence of predetermined type acoustic nonspectral feature signals; said similarity signal generating means including: means responsive to said time frame sequences of speech pat..rn and reference template spectral and nonspectral feature signals for generating a plurality of signals for each time frame of the speech pattern including a signal measuring the correspondence between said spectral feature signals of the speech pattern time frame and the spectral feature signals of the reference pattern template and a signal measuring the correspondence between the nonspectral feature signals of the speech pattern time frame and the nonspectral feature signals of the reference pattern template; and means responsive to the plurality of correspondence measuring signals for forming a signal for the reference pattern representative of the similarity between said speech pattern and said reference pattern.

4,519,095
ADHESIVE CHANNEL CLOSURE FOR FLEXIBLE BAGS

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 335,798, Dec. 30, 1981, abandoned. This application Dec. 9, 1983, Ser. No. 559,846
Int. Cl.³ B65D *33/20*
U.S. Cl. 383—86 **19 Claims**

1. A flexible thermoplastic bag comprising:

a front wall and a back wall, said walls being joined along the major portion of their opposite longitudinal edges and bottom;

an open mouth adjacent to the top edge of said front wall, said open mouth of said bag having a flap which is an extension of the back bag wall and having longitudinal edges which are not joined to the upper edges of said back wall; and

a closure comprising:

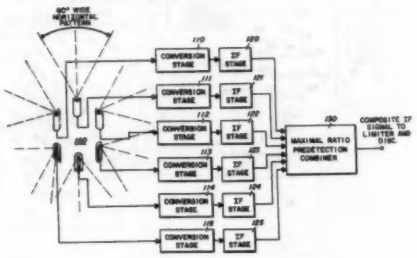
a female channel strip affixed to a surface of one of said front wall or said flap at a preselected distance from said opening, said channel strip having a trough between two spreadable channel ribs wherein the height of the interior walls of said channel ribs is about 40 mils, the distance between the interior walls of said channel is about one-quarter inch, and the thickness of each of said channel ribs is about 20 mils; and

a pressure sensitive adhesive layer in said trough, the thickness of said adhesive layer being less than the interior height of said channel ribs, said closure being positioned on said bag such that when said flap is folded over the opening of said bag, a flat deformable portion of said bag is pressable into said trough by spreading said channel ribs, whereby a seal is formed without a need for mating registration between said female channel strip and any particular portion of said flat deformable portion of said bag by contacting said pressure sensitive adhesive layer with said flat deformable portion.

4,519,096
LARGE DYNAMIC RANGE MULTIPLIER FOR A MAXIMAL-RATIO DIVERSITY COMBINER

Frank J. Cerny, Jr., North Riverside, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 493,802, May 12, 1983, abandoned, which is a continuation of Ser. No. 268,613, Jun. 1, 1981, abandoned, which is a continuation of Ser. No. 84,980, Oct. 15, 1979, abandoned. This application Feb. 21, 1984, Ser. No. 580,775
Int. Cl.³ H04B *7/08*
U.S. Cl. 455—137 **28 Claims**



1. A maximal-ratio predetection diversity combiner for coherently combining a plurality of input signals each having a linear dynamic range exceeding forty decibels (40 db), having substantially the predetermined frequency and further having unknown and varying phases and magnitudes with respect to one another, said maximal ratio predetection diversity combiner comprising:

means for generating a reference signal having a predetermined reference frequency for each input signal;

for each input signal:

(i) means for dividing each input signal into first and second portions;

(ii) first means for multiplying the first portion of each

input signal with the reference signal to provide a first product signal having a phase that is the difference between the phase of the input signal and the reference signal;

(iii) means for providing a variable phase shift to said first product signal, said phase shift being a function of the frequency of said first product signal; and

(iv) second means for multiplying the second portion of each input signal and the corresponding phase shifted first product signal to provide a second product signal that is substantially co-phased with the reference signal and substantially independent of the phase of the input signal, said second multiplying means being comprised of only a single field-effect transistor (FET) having source, gate and drain terminals, said FET being predeterminedly biased as an active device with the drain-to-source channel of said FET biased within the FET's pinch-off region and the gate-to-source junction of said FET biased at substantially one-half of the FET's gate pinch-off voltage for multiplying the second portion of the input signal and the phase shifted first product signal to provide the second product signal, such that the magnitude of the second product signal is proportional to the product of the magnitudes of the second portion of the input signal and the first product signal over substantially twice the dynamic range of the corresponding input signal; and

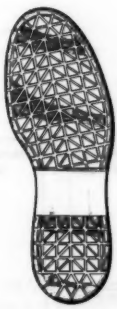
said FET's each being arranged such that the second portion of the input signal is coupled to the source terminal thereof, the phase shifted product signal is coupled to the gate terminal thereof, and the second product signal is provided at the drain terminal thereof; and the drain terminals of all FET's being connected to a common point for providing a phase coherent composite signal.

DESIGNS

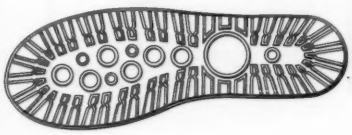
MAY 21, 1985

278,850
SHOE UPPER
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,946
Term of patent 14 years
U.S. Cl. D2—314

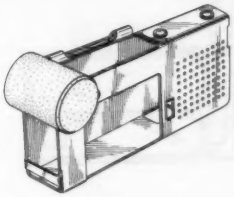
278,851
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Sep. 27, 1982, Ser. No. 424,210
Term of patent 14 years
U.S. Cl. D2—320



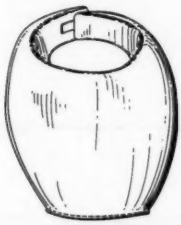
278,852
SHOE SOLE
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,948
Term of patent 14 years
U.S. Cl. D2—320



278,853
TAPE RECORDER CASE
Kazuaki Takata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1983, Ser. No. 470,470
Claims priority, application Japan, Oct. 6, 1982, 57-45296
Term of patent 14 years
U.S. Cl. D2—400

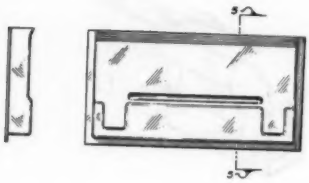


278,854
COLD WEATHER NECK COVER
Gary F. Protto, 611 E. 25th, Spokane, Wash. 99203
Filed Sep. 27, 1982, Ser. No. 424,166
Term of patent 14 years
U.S. Cl. D2—343



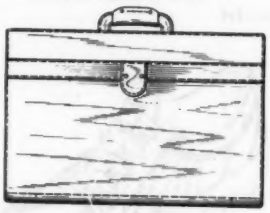
278,855
AGILE SAFETY PIN
Fan B. Liang, 2Fl., 61, Jen Shou St., Shan Chung City, Taiwan
Filed Dec. 3, 1982, Ser. No. 446,573
Term of patent 14 years
U.S. Cl. D2—405

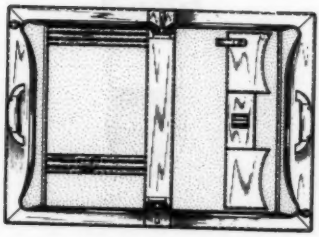
278,856
CASSETTE CONTAINER
Peter V. Bodourian, 2537 Paladin St., Anaheim, Calif. 92806, and Joseph M. Grispino, 3069 Loren La., Costa Mesa, Calif. 92626
Filed Jul. 14, 1982, Ser. No. 398,307
Term of patent 14 years
U.S. Cl. D3—35



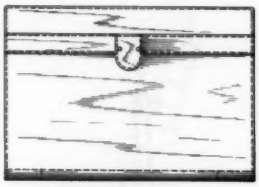
278,857
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed May 18, 1983, Ser. No. 495,790
Term of patent 14 years
U.S. Cl. D3—52

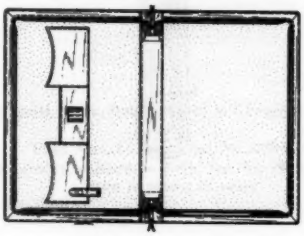
278,858
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed May 18, 1983, Ser. No. 495,792
Term of patent 14 years
U.S. Cl. D3—71





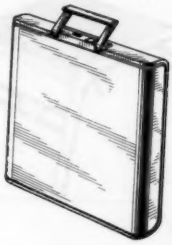
278,859
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed May 18, 1983, Ser. No. 495,791
Term of patent 14 years
U.S. Cl. D3—71



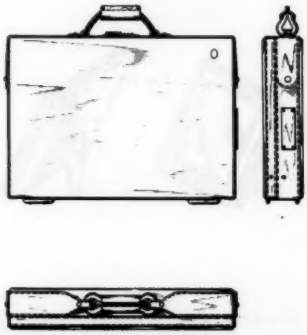


278,860
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed May 18, 1983, Ser. No. 495,789
Term of patent 14 years
U.S. Cl. D3—71

278,861
LUGGAGE CASE
Makio Hasuike, Milan, Italy, assignor to Poltrona Frau S.p.A., Tolentino, Italy
Filed Jan. 11, 1982, Ser. No. 338,496
Claims priority, application Italy, Jul. 3, 1981, 22278 B/81
Term of patent 14 years
U.S. Cl. D3—72



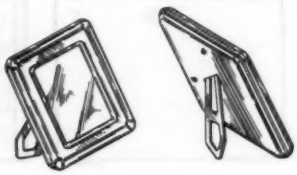
278,862
EXECUTIVE CASE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed May 18, 1983, Ser. No. 495,795
Term of patent 14 years
U.S. Cl. D3—76



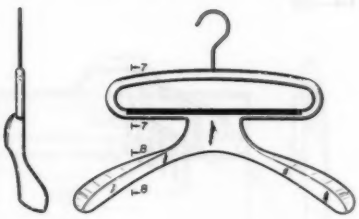
278,863
TOOTH CLEANSING DEVICE
William F. Bradley, 2301 Roscomare Rd., Bel-Air, Calif. 90077
Filed Mar. 21, 1983, Ser. No. 477,426
Term of patent 14 years
U.S. Cl. D4—108

278,864
OTTOMAN
Donald J. Borichevsky, Wells, Vt., assignor to Telescope Folding Furniture Co., Inc., Granville, N.Y.
Filed Jan. 28, 1983, Ser. No. 462,034
Term of patent 14 years
U.S. Cl. D6—349

278,865
PICTURE FRAME
James A. McCaffrey, 1220 St. Lawrence Dr., Alpharetta, Ga. 30201
Filed Jul. 22, 1983, Ser. No. 516,099
Term of patent 14 years
U.S. Cl. D6—311



278,866
CLOTHES HANGER
Robert Rieser, 407 Littleworth La., Seacliff, N.Y. 11579
Filed Jul. 7, 1983, Ser. No. 511,490
Term of patent 14 years
U.S. Cl. D6—319



278,867
HANGER
Donald Tendrup, 32 Del Marie La., Nesconsett, N.Y. 11767, and Joseph Devito, 7 Ingrid Ct., Hauppauge, N.Y. 11788
Filed Nov. 2, 1983, Ser. No. 547,968
Term of patent 14 years
U.S. Cl. D6—327

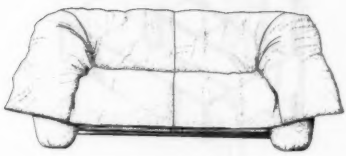
278,868
COMBINED SWING AND PLURAL SHELF UNIT
Richard L. Burris, Joplin, Mo., and Bill W. Stoner, Miami, Okla., assignors to George Mayer Manufacturing, Inc., Miami, Okla.
Filed Mar. 9, 1983, Ser. No. 473,856
Term of patent 14 years
U.S. Cl. D6—347

278,869
CHAIR
Rainer Bohl, Schondorf, Fed. Rep. of Germany, assignor to Roeder GmbH Sitzmoebelwerke, Fed. Rep. of Germany
Filed Mar. 15, 1983, Ser. No. 475,496
Term of patent 14 years
U.S. Cl. D6—366

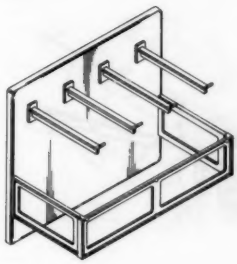
278,870
CHAIR
Carlo Giorgetti, Meda, Italy, assignor to Giorgetti S.p.A., Meda, Italy
Filed Mar. 16, 1983, Ser. No. 475,847
Claims priority, application Italy, Sep. 16, 1982, 22914-B/82
Term of patent 14 years
U.S. Cl. D6—369

278,871
ARM-CHAIR
Carlo Giorgetti, Meda, Italy, assignor to Giorgetti S.p.A., Meda, Italy
Filed Mar. 16, 1983, Ser. No. 475,846
Claims priority, application Italy, Sep. 16, 1982, 22913 B/82
Term of patent 14 years
U.S. Cl. D6—369

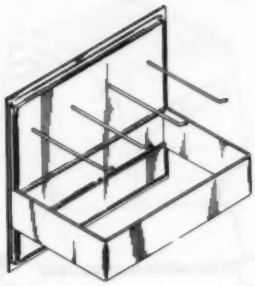
278,872
SEAT
Pierre E. C. Roset, Montagnieu, France, assignor to Roset S.A., Briord, France
Filed Dec. 20, 1982, Ser. No. 451,238
Claims priority, application France, Jun. 21, 1982, DM/001556
Term of patent 14 years
U.S. Cl. D6—381



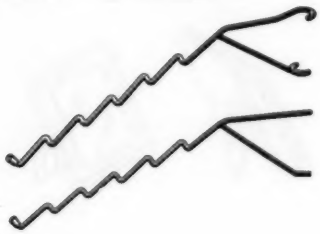
278,873
HOSIERY PACKAGE DISPLAY RACK
James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677, and Ilan Plawker, Englewood Cliffs, N.J., assignors to James L. Thorneburg, Statesville, N.C.
Filed Nov. 7, 1983, Ser. No. 549,085
Term of patent 14 years
U.S. Cl. D6—517



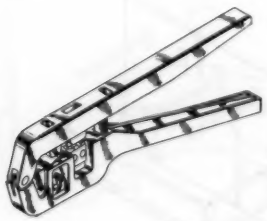
278,874
HOSIERY PACKAGE DISPLAY RACK
James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677, and Ilan Plawker, Englewood Cliffs, N.J., assignors to James L. Thorneburg, Statesville, N.C.
Filed Nov. 7, 1983, Ser. No. 549,288
Term of patent 14 years
U.S. Cl. D6—517



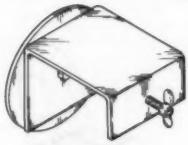
278,875
SUPPORT ARM FOR RACKS OR THE LIKE
Howard R. Beard, Unit 4, 309 Young St., Wayville, South Australia, Australia
Filed Aug. 13, 1982, Ser. No. 407,755
Term of patent 14 years
U.S. Cl. D6—566



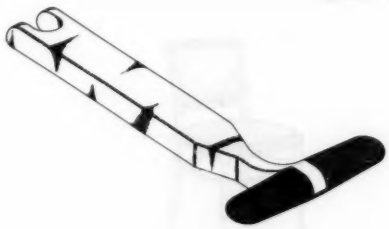
278,876
COMMUNICATION PLUG INSTALLATION TOOL
Daniel Meyer, Hector, Minn., assignor to Communications Systems, Inc., Hector, Minn.
Filed Aug. 4, 1982, Ser. No. 405,293
Term of patent 14 years
U.S. Cl. D8—52



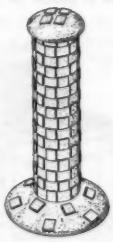
278,877
SAW BLADE HOLDER
Ralph Bozorth, 912 Front St., Glendora, N.J. 08029
Filed Jul. 23, 1982, Ser. No. 401,237
Term of patent 14 years
U.S. Cl. D8—71



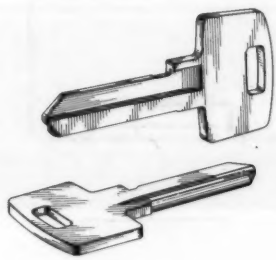
278,878
LUGGAGE STEERING HANDLE
David E. Workman, Evergreen, and William L. King, Denver, both of Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Jan. 3, 1983, Ser. No. 453,812
Term of patent 14 years
U.S. Cl. D8—300



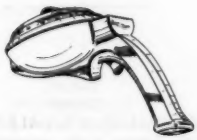
278,879
GRIP
Chun-Hsiung Hwung, No. 66, Lin Jou West St., Tainan, Taiwan
Filed Oct. 14, 1983, Ser. No. 542,680
Term of patent 14 years
U.S. Cl. D8—303



278,880
KEY BLANK
Bo Widén, Torshälla, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden
Filed Feb. 10, 1982, Ser. No. 347,612
Claims priority, application Sweden, Aug. 14, 1981, 81-1748
Term of patent 14 years
U.S. Cl. D8—347

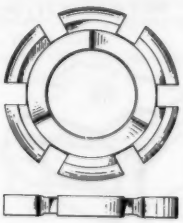


278,881
KITE RETRIEVER
Woodroe C. Nicholson, R.R. #3, Lakefield, Ontario, Canada (K0L 2H0)
Filed Aug. 9, 1982, Ser. No. 406,386
Claims priority, application Canada, Aug. 6, 1982, 06-08-82-5
Term of patent 14 years
U.S. Cl. D8—359



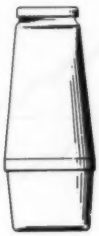
278,882
SELF-LOCKING DISPLAY CHIP
Richard L. Vater, Alexandria, Ky., and William F. Clements, Fairfield, Ohio, assignors to Container Corporation of America, Chicago, Ill.
Filed Sep. 7, 1982, Ser. No. 415,180
Term of patent 14 years
U.S. Cl. D8—382

278,883
REVERSIBLE FRICTION-RING WASHER
Bengt O. Frieberg, 869 Picaacho, La Habra Heights, Calif. 90631
Filed Dec. 30, 1982, Ser. No. 454,726
Term of patent 14 years
U.S. Cl. D8—399

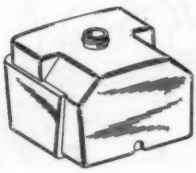


278,884
CHAIN LINK
Gerald Glass, Springfield, Mo., assignor to Custom Metalcraft, Inc., Springfield, Mo.
Filed Apr. 28, 1983, Ser. No. 489,383
Term of patent 14 years
U.S. Cl. D8—499

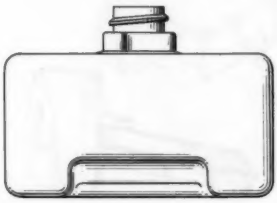
278,885
PLASTIC BOTTLE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Jan. 7, 1983, Ser. No. 456,193
Term of patent 14 years
U.S. Cl. D9—349



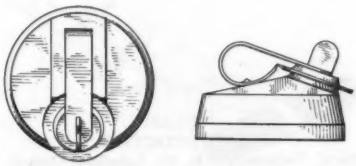
278,886
CONTAINER FOR LIQUIDS
Joseph S. Kanfer, 2825 N. Walnut Ridge, Akron, Ohio 44313
Filed Jan. 31, 1983, Ser. No. 462,531
Term of patent 14 years
U.S. Cl. D9—375



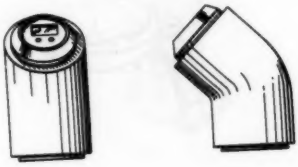
278,887
SOAP CONTAINER
Robert L. Steiner, Chicago, Ill., assignor to Steiner Corporation, Salt Lake City, Utah
Filed Sep. 30, 1982, Ser. No. 430,133
Term of patent 14 years
U.S. Cl. D9—403



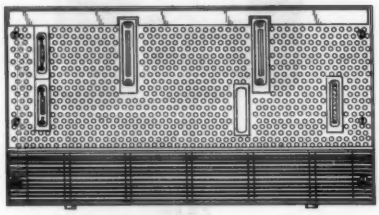
278,888
BEVERAGE CAN LID
Brad A. Plumb, 9934 Summerson La., Lakeside, Calif. 92040
Filed May 5, 1983, Ser. No. 491,877
Term of patent 14 years
U.S. Cl. D9—449



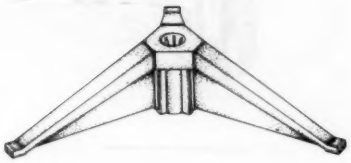
278,889
DIGITAL CLOCK/CALENDAR
George L. McCain, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed May 9, 1983, Ser. No. 495,391
Term of patent 14 years
U.S. Cl. D10—15



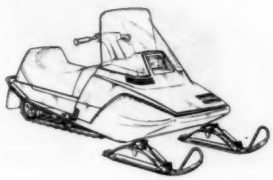
278,890
CIRCUIT BOARD TESTING EQUIPMENT
Kurt Groetzner, Stuttgart, and Bert Wurst, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 19, 1982, Ser. No. 340,792
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, MR 5332
Term of patent 14 years
U.S. Cl. D10—75



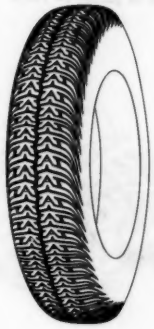
278,891
TREE STAND
Monte Levin, New York, N.Y., assignor to Standex International Corporation, Salem, N.H.
Filed Jan. 3, 1983, Ser. No. 455,036
Term of patent 14 years
U.S. Cl. D11—130.1



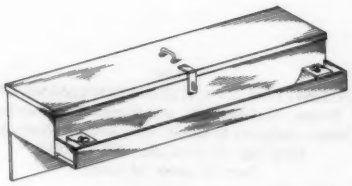
278,892
SNOWMOBILE
Heiji Kobayashi, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Dec. 21, 1982, Ser. No. 451,793
Term of patent 14 years
U.S. Cl. D12—7



278,893
TIRE
Stephen Lash, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 24, 1983, Ser. No. 507,327
Term of patent 14 years
U.S. Cl. D12—146



278,894
COMBINED TOOL BOX VEHICLE BUMPER, BICYCLE CARRIER AND AIR DAM
Tommy H. James, 6828 Donerail Dr., Sacramento, Calif. 95842
Filed Sep. 27, 1982, Ser. No. 424,332
Term of patent 14 years
U.S. Cl. D12—157



278,895
DOOR GUARD FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,853
Term of patent 14 years
U.S. Cl. D12—167

278,896

CIRCUIT BREAKER HANDLE

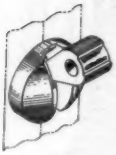
George S. Harper, Cambridge, Md., assignor to Airpax Corporation, Cambridge, Mass.

Continuation of Ser. No. 193,479, Oct. 3, 1980,. This application Nov. 10, 1983, Ser. No. 551,129

The portion of the term of this patent subsequent to Jun. 19, 1998, has been disclaimed.

Term of patent 14 years

U.S. Cl. D13—34



278,897

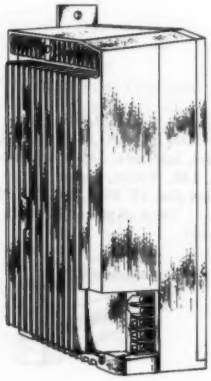
HOUSING FOR A CENTRAL PROCESSING UNIT

Jay M. Prager, Nashua, N.H., and Roman Y. Gonzales, Andover, Mass., assignors to Gould, Inc., Rolling Meadows, Ill.

Filed Sep. 23, 1982, Ser. No. 421,858

Term of patent 14 years

U.S. Cl. D13—40



278,898

COMBINED TAPE RECORDER AND RADIO RECEIVER

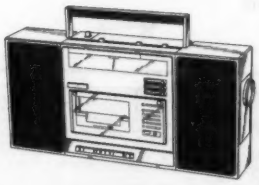
Teruyuki Nishimoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1982, Ser. No. 450,301

Claims priority, application Japan, Jun. 16, 1982, 57-27167

Term of patent 14 years

U.S. Cl. D14—5



278,899

TAPE RECORDER

Kazuaki Takata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,468

Claims priority, application Japan, Oct. 6, 1982, 57-45297

Term of patent 14 years

U.S. Cl. D14—6

278,900

TAPE RECORDER

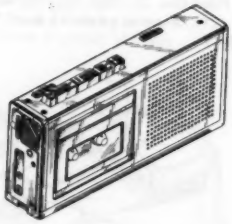
Kazuaki Takata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,472

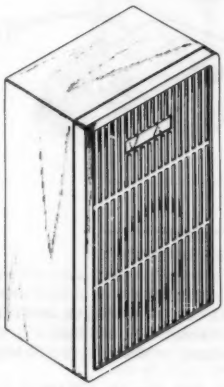
Claims priority, application Japan, Sep. 14, 1982, 57-41857

Term of patent 14 years

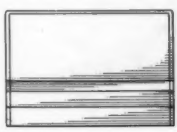
U.S. Cl. D14—6



278,901
SPEAKER
Patrick J. Murphy, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jun. 20, 1983, Ser. No. 459,487
Term of patent 14 years
U.S. Cl. D14—33



278,902
CABINET FOR A COMMUNICATION CONTROL SYSTEM OR THE LIKE
William M. Bissonette, North Hollywood, Calif., assignor to Security Technology Limited, West Los Angeles, Calif.
Filed Dec. 16, 1982, Ser. No. 450,480
Term of patent 14 years
U.S. Cl. D14—52

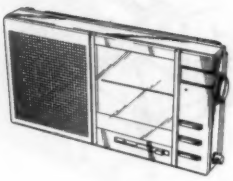


278,903
TELEPHONE
Teturo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Taikodenki Seisakusho, Tokyo, Japan
Filed Aug. 4, 1982, Ser. No. 404,980
Claims priority, application Japan, May 10, 1982, 57-20054
Term of patent 14 years
U.S. Cl. D14—53

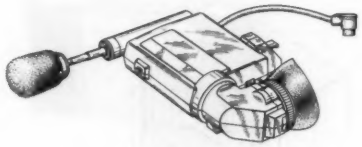
278,904
TELEPHONE
Donald R. White, 5406 Amalfi Dr., Irvine, Calif. 92715
Filed Jun. 16, 1982, Ser. No. 389,003
Term of patent 14 years
U.S. Cl. D14—53

278,905
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Richard J. Toth, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 28, 1983, Ser. No. 470,897
Term of patent 14 years
U.S. Cl. D14—68

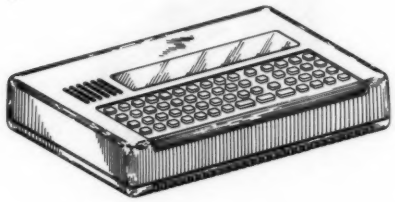
278,906
RADIO RECEIVER
Manao Nakamura, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 16, 1982, Ser. No. 450,175
Claims priority, application Japan, Jun. 16, 1982, 57-27171
Term of patent 14 years
U.S. Cl. D14—71



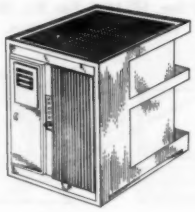
278,907
VIEW FINDER FOR VIDEO CAMERA
Koya Kurokawa, and Noriyuki Arai, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 28, 1982, Ser. No. 426,034
Claims priority, application Japan, Apr. 1, 1982, 57-13983
Term of patent 14 years
U.S. Cl. D14—84



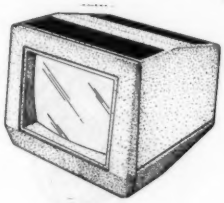
278,908
PORTABLE TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., and Robert E. Steinbugler, Raleigh, N.C., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 19, 1983, Ser. No. 459,156
Term of patent 14 years
U.S. Cl. D14—100



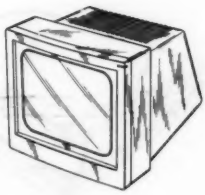
278,909
MODULE HOUSING FOR MAN-MACHINE INTERFACE
Paul Ramos, Woburn, Mass.; Richard E. Hudnall, Nashua, N.H., and Yuri Kunimi, Groton, Mass., assignors to Gould, Inc., Rolling Meadows, Ill.
Filed Mar. 29, 1982, Ser. No. 363,087
Term of patent 14 years
U.S. Cl. D14—102



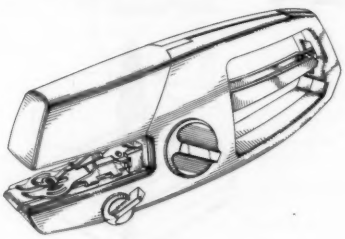
278,910
CRT DISPLAY HOUSING
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 429,768
Term of patent 14 years
U.S. Cl. D14—113



278,911
COMPUTER DISPLAY
Mitsuru Ohnuma, Tokyo; Kazuyuki Tsuburaya, Kodaira, and Masato Tanitsu, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1983, Ser. No. 469,807
Claims priority, application Japan, Mar. 26, 1982, 57-12219
Term of patent 14 years
U.S. Cl. D14—113



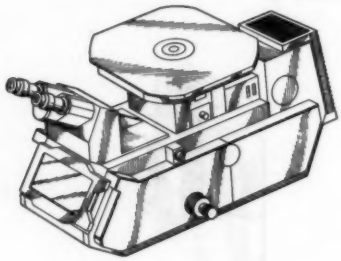
278,912
HAND OPERABLE SEWING MACHINE
Michael E. Laude, Danbury; Thomas J. Pendleton, N. Wilton, both of Conn.; Douglas W. Smith, Belle Mead, N.J.; Robert E. Dawson, Ridgefield, Conn., and Andrew J. Blance, Rye, N.Y., assignors to The Singer Company, Stamford, Conn.
Filed Jan. 14, 1983, Ser. No. 457,841
Term of patent 14 years
U.S. Cl. D15—69

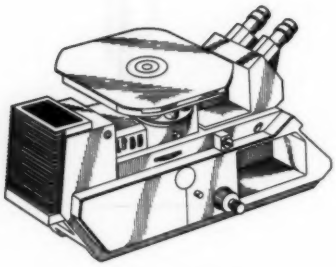


278,913
COMBINED CLAMP AND TABLE STAND FOR PHOTOGRAPHY
Rudolph Hanke, Monheim, Fed. Rep. of Germany, assignor to Hama Hamaphot KG Hanke & Thomas, Monheim, Fed. Rep. of Germany
Filed May 12, 1982, Ser. No. 377,329
Term of patent 14 years
U.S. Cl. D16—45

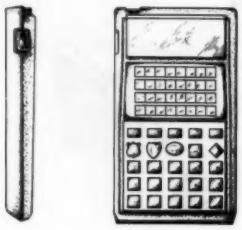
278,914
CONTACT LENS INSERTER
Arthur C. Jermyn, 15914 Overview Rd., Poway, Calif. 92064
Filed Jun. 25, 1982, Ser. No. 392,260
Term of patent 14 years
U.S. Cl. D16—124

278,915
MICROSCOPE
Werner Hoelbl; Georg N. Nyman, and Karl Moser, all of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria
Filed Feb. 7, 1983, Ser. No. 464,170
Term of patent 14 years
U.S. Cl. D16—131



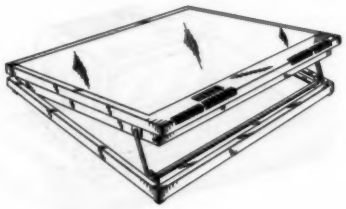


278,916
CALCULATOR FOR HIGHWAY TRAVEL
John E. Gallman, P.O. Box 178, Denver, N.C. 28037
Filed Dec. 19, 1983, Ser. No. 563,205
Term of patent 14 years
U.S. Cl. D18—7

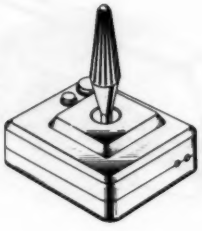


278,917
PORTABLE ELECTRONIC MUSICAL CHORD INSTRUMENT
Barry N. Sinkoff, and Howard P. Feldman, both of San Diego, Calif., assignors to Suzuki Musical Instrument Corporation, San Diego, Calif.
Filed Sep. 30, 1982, Ser. No. 431,131
Term of patent 14 years
U.S. Cl. D17—1

278,918
PORTABLE LIGHT BOX
Bernard Morcheles, Short Hills, N.J., assignor to Stacor Corporation, Newark, N.J.
Filed Oct. 7, 1982, Ser. No. 433,257
Term of patent 14 years
U.S. Cl. D19—52

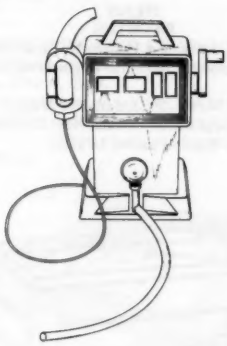


278,919
CONTROL FOR A VIDEO GAME OR THE LIKE
Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.
Filed Jan. 6, 1983, Ser. No. 456,259
Term of patent 14 years
U.S. Cl. D21—48



278,920
TOY CHAIN LINK
William J. Wichman, Glendora, Calif., assignor to Discovery Toys, Benicia, Calif.
Filed Dec. 20, 1982, Ser. No. 450,828
Term of patent 14 years
U.S. Cl. D21—59

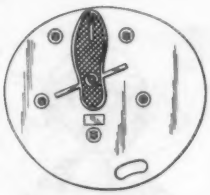
278,921
TOY GAS PUMP
Larry R. Nagode, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1983, Ser. No. 461,608
Term of patent 14 years
U.S. Cl. D21—124



278,922
ROBOT
Douglas H. Jones, Felton, and Siegfried W. Salat, Palo Alto Hills, both of Calif., assignors to Androbot, Inc., San Jose, Calif.
Filed Dec. 7, 1982, Ser. No. 447,655
Term of patent 14 years
U.S. Cl. D21—150

278,923
ROCKING PONY FOR A CRIB RAIL OR SIMILAR ARTICLE
Christine H. Anderson, Fullerton, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Continuation-in-part of Ser. No. 417,317, Sep. 13, 1982,. This application Oct. 25, 1982, Ser. No. 436,491
Term of patent 14 years
U.S. Cl. D21—165

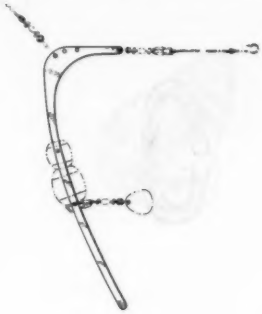
278,924
EXERCISING PLATFORM
Jerry E. Seel, 595 Meadowbrook Dr., and Gary W. Gray, 12 Maume Ct., both of Adrian, Mich. 49221
Continuation-in-part of Ser. No. 269,601, Jun. 2, 1981,. This application Sep. 30, 1982, Ser. No. 431,135
Term of patent 14 years
U.S. Cl. D21—193



278,925
ROLLER SKATE CHASIS
Melvin H. Scheller, Mt. Olive, Ill., assignor to Roller Derby Skate Corporation, Litchfield, Ill.
Filed Dec. 7, 1982, Ser. No. 447,647
Term of patent 14 years
U.S. Cl. D21—226

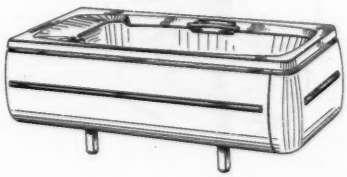
278,926
FISHING LURE
James L. Bagley, Box 6751, Winter Haven, Fla. 33880
Filed Mar. 2, 1983, Ser. No. 471,467
Term of patent 14 years
U.S. Cl. D22—27

278,927
TROLLING SINKER
Clifford E. Uzell, Mayfield Heights, Ohio, assignor to Ray-J, Inc., Nokomis, Fla.
Filed Mar. 30, 1983, Ser. No. 480,253
Term of patent 14 years
U.S. Cl. D22—30

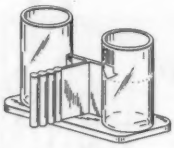


278,928
WATERING CAN
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 13, 1982, Ser. No. 449,523
Term of patent 14 years
U.S. Cl. D23—11

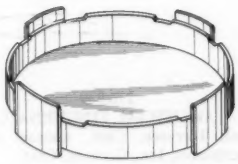
278,929
BATHTUB
John D. Burgess, Loretto, and Thomas E. Taylor, Rexdale, both of Canada, assignors to Acriform Engineering Inc., Newmarket, Canada
Filed May 3, 1983, Ser. No. 491,310
Claims priority, application Canada, Nov. 23, 1982, 23-11-82-4
Term of patent 14 years
U.S. Cl. D23—56



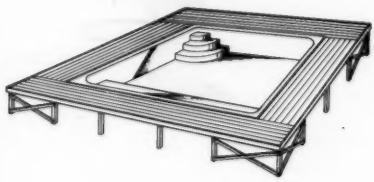
278,930
PLASMA SEPARATOR CARTRIDGE OR SIMILAR ARTICLE
Gianfranco D. Zaccai, Boston; David B. Wheinstone, Danvers; Hamid Keramaty, Lexington, and William E. Flynn, Chelmsford, all of Mass., assignors to Allied Corporation, Morristown, N.J.
Filed Apr. 5, 1982, Ser. No. 365,876
Term of patent 14 years
U.S. Cl. D24—21



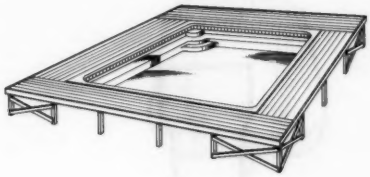
278,931
PETRI TRAY
Lars P. Larsson, Vastra Palmgrensgatan 91, S-421 77 Vastra Frolunda, and Bror J.-E. Brorsson, Safjallsgatan 24, S-431 39 Molndal, both of Sweden
Filed Aug. 25, 1982, Ser. No. 411,290
Claims priority, application Sweden, Feb. 26, 1982, 82-0457
Term of patent 14 years
U.S. Cl. D24—31



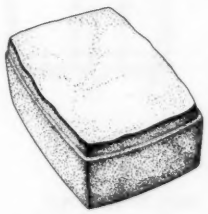
278,932
PREFABRICATED SWIMMING POOL
George P. Sullivan, Seattle, Wash., assignor to San Juan Products, Inc., Hemet, Calif.
Continuation-in-part of Ser. No. 266,841, May 26, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,856
Term of patent 14 years
U.S. Cl. D25—2



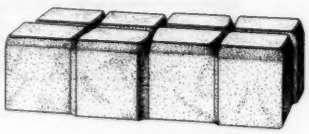
278,933
PREFABRICATED SWIMMING POOL
George P. Sullivan, Seattle, Wash., assignor to San Juan Products, Inc., Hemet, Calif.
Continuation of Ser. No. 266,959, May 16, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,855
Term of patent 14 years
U.S. Cl. D25—2



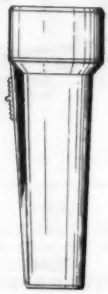
278,934
PAVING STONE
Rolf Scheiwiller, Beichelacker, CH-3115 Gerzensee, Switzerland
Filed Dec. 17, 1981, Ser. No. 331,785
Claims priority, application Switzerland, Jul. 7, 1981, 111890
Term of patent 14 years
U.S. Cl. D25—86



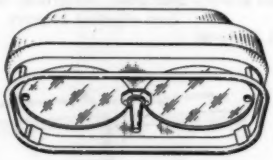
278,935
PAVING STONE
Rolf Scheiwiller, Beichelacker, CH-3115 Gerzensee, Switzerland
Filed Dec. 17, 1981, Ser. No. 331,783
Claims priority, application Switzerland, Jul. 7, 1981, 111874
Term of patent 14 years
U.S. Cl. D25—86



278,936
TORCH
Kung C. Hung, Tsuen Wan, Hong Kong, assignor to Freezinbot Bottle Company Limited, Kowloon, Hong Kong
Filed Aug. 3, 1982, Ser. No. 404,875
Claims priority, application United Kingdom, Jun. 11, 1982, 1007211
Term of patent 14 years
U.S. Cl. D26—49



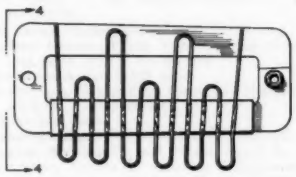
278,937
SURGICAL LIGHT
Donald H. Peeler, Pittsford, and Daniel Calabra, Henrietta, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Nov. 22, 1982, Ser. No. 443,247
Term of patent 14 years
U.S. Cl. D26—65



278,938
LAMP CHIMNEY
Kenneth A. Burket, Horseheads, and Gerhard F. Koenig, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed May 24, 1982, Ser. No. 381,014
Term of patent 14 years
U.S. Cl. D26—132

278,939
ARTIFICIAL FINGERNAIL
Yosh Hokama, Torrance, Calif., assignor to International Beauty Distributors, Inc., Gardena, Calif.
Filed Sep. 9, 1982, Ser. No. 416,265
Term of patent 14 years
U.S. Cl. D28—56

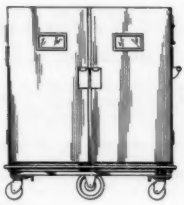
278,940
HAIRPIECE SECURING CLIP
Peter A. Incando, 8907 Valley Blvd., Rosemead, Calif. 91770
Filed Dec. 5, 1983, Ser. No. 557,887
Term of patent 14 years
U.S. Cl. D28—93



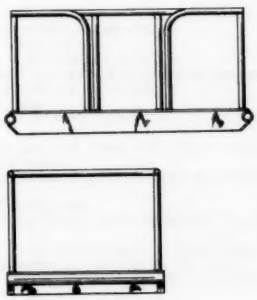
278,941
AQUARIUM
Duane F. Bohnsack, Grand Forks, N. Dak., assignor to Mid-American Industries, Inc., Detroit Lakes, Minn.
Filed Jun. 22, 1983, Ser. No. 506,729
Term of patent 14 years
U.S. Cl. D30—8

278,942
VACUUM CLEANER
Lawrence L. Chiu, North Point, Hong Kong, assignor to Joiner Electric Products Company Ltd., Kwai Chung, Hong Kong
Filed Mar. 3, 1983, Ser. No. 471,472
Claims priority, application United Kingdom, Oct. 27, 1982, 1009424
Term of patent 14 years
U.S. Cl. D32—18

278,943
CIRCUIT BOARD CURING CART
Douglas K. Dennis, Guelph, Canada, assignor to AMF Incorporated, White Plains, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,649
Term of patent 14 years
U.S. Cl. D34—19



278,944
EQUIPMENT SKID
Don A. Bresie; Jack M. Burns, and Donald W. Fowler, all of 5407 N. IH 35, Austin, Tex. 78723
Filed Sep. 7, 1982, Ser. No. 415,419
Term of patent 14 years
U.S. Cl. D34—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Corporation. Process for removing hydroperoxides and aldehydes from allyl-alkyl ether. 4,518,805, Cl. 568-444.000.

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Aktieselskabet Jens Villadsens Fabriker: *See*—
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Albert, Richard D. Scanning x-ray spectrometry method and apparatus. 4,519,092, Cl. 378-045.000.

Albertini, Rocco D.; and Grzeczkowski, Thomas V., to Baldt Incorporated. Mooring system with frangible links. 4,517,913, Cl. 114-293.000.

Alberts, Robert: *See*—
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Albrecht, Joachim; and Duerig, Thomas, to BBC Brown, Boveri & Company, Limited. Material which is at least partially made from a constituent having a one-way shape memory effect and process to produce said material. 4,518,444, Cl. 148-402.000.

Alcan International Limited: *See*—
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Alexander, L. Bruce, to Brown International Corporation. Method and apparatus for finishing juices from fruits and vegetables and the like. 4,518,621, Cl. 426-495.000.

Alexander, Peter W.; and Haddad, Paul R., to Unisearch Limited. Potentiometric method. 4,518,463, Cl. 204-1.00T.

Alexeev, Alexei I.: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.

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Allais, Andre ; Clemence, Francois; Deraedt, Roger; and Lemartret, Odile, to Roussel Uclaf. Benzoxazine-4-one intermediates. 4,518,775, Cl. 544-92.000.

Allegheny Ludlum Steel Corporation: *See*—
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Allen, C. Wayne: *See*—
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Allen, Landon K., to Advanced Micro Devices, Inc. Selective removal of coating material on a coated substrate. 4,518,678, Cl. 430-311.000.

Allen, Richard A. Folding carrier. 4,518,108, Cl. 224-314.000.

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Aluminium Pechiney: *See*—
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American Seating Company: *See*—
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AMFIT, Inc.: *See*—
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Arora, Mulk R., to North American Philips Corporation. Two step electrochemical etch process for high volt aluminum anode foil. 4,518,471, Cl. 204-129.100.

Asada, Shuji; and Nanbu, Tadamasa, to Matsushita Electric Industrial Co., Ltd. Electric iron with cord reel device. 4,517,757, Cl. 38-88.000.

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Audeh, Costandi A.; and Mitchell, Thomas O., to Mobil Oil Corporation. Process for the efficient utilization of solvent modified oil shales. 4,518,480, Cl. 208-11.0LE.
Auerbach, Guenther, to Sandoz Ltd. Monoazo compounds having a sulfo group-containing diazo component radical and a 6-(2'-chloro-1',3',5'-triazin-6'-ylamino)-1-hydroxy-3-sulfonaphthalene coupling component radical having a substituted amino group in the 4'-position. 4,518,391, Cl. 8-549.000.
Augenstein, Reiner, to Otto Bihler Maschinenfabrik GmbH & Co. KG. Method and apparatus for formation of packs of punched plates useful for spark extinguishing. 4,517,725, Cl. 29-417.000.
Autio, Karin; Kiesvaara, Martti; and Malkki, Yrjo , to Valtion Teknillinen Tutkimuskeskus. Method for dividing blood hemoglobin into heme and globin. 4,518,525, Cl. 260-112.00B.
Autoflug GmbH: *See*—
Butenop, Klaus; and Singer, Klaus-Peter, 4,518,131, Cl. 242-107.40B.
Sedlmayr, Gerhard, 4,518,174, Cl. 280-808.000.
Automation Industries, Inc.: *See*—
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,518,018, Cl. 138-130.000.
Automotive Products Limited: *See*—
Windsor, Harry M., 4,518,064, Cl. 192-3.580.
Avco Everett Research Laboratory, Inc.: *See*—
Dagenais, Dominique M., 4,518,232, Cl. 350-620.000.
Avery, Grant D., to Sprague Electric Company. Ferromagnetic article detector with dual Hall-sensors. 4,518,918, Cl. 324-208.000.
Aykut, Kurt; and Reissmann, Klaus, to E.C.H. Will (GmbH & Co.). Apparatus for gathering and singularizing stacks of paper sheets or the like. 4,518,075, Cl. 198-460.000.
Aytac, Haluk M. Three-level MOS logic circuit. 4,518,875, Cl. 307-473.000.
Azar, Jack C.: *See*—
Henry, Arnold W.; Azar, Jack C.; and Sagal, John, 4,518,655, Cl. 428-329.000.
B.A.T. Cigaretten-Fabriken GmbH: *See*—
Krappitz, Heinz; Carstensen, Hans-Peter; and Weinhold, Friedrich, 4,517,829, Cl. 73-49.800.
Baasner, Bernd; Hagemann, Hermann; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of fluorinated nitroalkanes. 4,518,812, Cl. 568-946.000.
Babcock & Wilcox Company, The: *See*—
Bohl, Thomas L., 4,518,699, Cl. 436-49.000.
Babyak, Richard J.: *See*—
Oefinger, Richard W.; and Babyak, Richard J., 4,517,820, Cl. 72-391.000.
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., to Data General Corporation. Unique memory for use in a digital data system. 4,519,030, Cl. 364-200.000.
Backes, Reiner, to ITT Industries, Inc. MOS Transition detector for plural signal lines using non-overlapping complementary interrogation pulses. 4,518,872, Cl. 307-448.000.
Backes, Reiner, to ITT Industries, Inc. Integrated circuit for a keyboard of an electronic apparatus. 4,518,951, Cl. 340-365.00S.
Badaliants, Khoren A.: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.
Badders, Edwin T. Noise attenuating filter for fluid flow systems. 4,518,493, Cl. 210-137.000.
Baer, Jurgen: *See*—
Gillhaus, Horst; Hegewaldt, Fritz; Faber, Wolfgang; Baer, Jurgen; and Toplak, Ernst, 4,518,352, Cl. 432-199.000.
Baeten, Roger L.: *See*—
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Bailey, Helen A. B.: *See*—
Pierce, Harry C.; and Bailey, Helen A. B., 4,518,152, Cl. 254-134.30R.
Baker, Dwight C.: *See*—
Olsen, Richard E.; and Baker, Dwight C., 4,519,028, Cl. 364-200.000.
Baker, Robert G., to Nordson Corporation. Hot melt adhesive hose cuff. 4,518,016, Cl. 138-96.00R.
Baker, Walter F. Woodbox. 4,517,956, Cl. 126-283.000.
Baldenko, Dmitry F.; Gusman, Moisei T.; and Semenets, Valery I., to Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Tekhniki. Bottom hole motor for driving rock-breaking tool. 4,518,049, Cl. 175-107.000.
Baldt Incorporated: *See*—
Albertini, Rocco D.; and Grzeczkowski, Thomas V., 4,517,913, Cl. 114-293.000.
Bales, Michael E., to Maytag Company, The. Grease collection system for range. 4,517,886, Cl. 99-425.000.
Ball, Herbert. Internal combustion engine. 4,517,937, Cl. 123-190.00D.
Ballu, Patrick J., to Tecnoma. Hand-operated hose for atomizing a liquid for the treatment of plants. 4,518,122, Cl. 239-530.000.
Baltimore Aircoil Company, Inc.: *See*—
Carter, Thomas P.; Schinner, Edward N.; Harrison, Richard H., Jr.; and Cates, Robert E., 4,518,544, Cl. 261-112.000.
Banno, Takashi; Seki, Tadashi; Kawaguchi, Masafumi; Tanaka, Yukio; Iwasaki, Morikatsu; and Nagasawa, Toshio, to Chugai Ro Co., Ltd.; and Mitsubishi Kinzoku Kabushiki Kaisha. Vacuum sintering furnace. 4,518,353, Cl. 432-205.000.
Bantick, John R.; Fuher, John; Hardern, David N.; and Lee, Thomas J., to Fisons plc. Naphthalene and 2-oxo-benzopyran acids and derivatives and pharamaceutical use thereof. 4,518,612, Cl. 514-457.000.
Banu, Mihai, to AT&T Bell Laboratories. Common mode signal detector. 4,518,870, Cl. 307-356.000.
Baravian, Jean; and Barbey, Jacques, to Rhone-Poulenc Fibres. Waterproof membrane with fuse bonded non-woven reinforcement. 4,518,658, Cl. 428-291.000.
Barbee, Robert B.; and Davis, Burns, to Eastman Kodak Company. Copolyesters from ether-containing glycols and acids. 4,518,763, Cl. 528-173.000.
Barbey, Jacques: *See*—
Baravian, Jean; and Barbey, Jacques, 4,518,658, Cl. 428-291.000.
Barch, Herbert W.; Salego, George T.; and Blair, Rudolph, to PPG Industries, Inc. Applicator for treating textile filaments with chemical treatments. 4,517,916, Cl. 118-234.000.
Bares, Jan, to Xerox Corporation. Development system using a thin layer of marking particles. 4,518,245, Cl. 355-3.0DD.
Barfell, Don L., to Elkhart Machine & Tool Co., Inc. Seat pedestal. 4,518,139, Cl. 248-418.000.
Barham, Jerel J.: *See*—
Moser, William H., 4,518,303, Cl. 414-528.000.
Barker, Jeffrey G., to Ranks Hovis McDougall p.l.c. Method of and apparatus for wrapping articles. 4,517,786, Cl. 53-450.000.
Barker, Michael, to Dow Chemical Company, The. Roof insulation retention. 4,517,776, Cl. 52-90.000.
Barnhart, Ronald W.: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,518,061, Cl. 187-18.000.
Barr, William A. Safety parking brake for automatic transmissions. 4,518,066, Cl. 192-4.00C.
Barrett, Raymond L., Jr.; and Gross, Thomas A. O., to Sensormatic Electronics Corporation. Duplexer with sum and difference signal outputs. 4,519,066, Cl. 370-24.000.
Barry Wright Corporation: *See*—
Peretti, Mark F., 4,518,368, Cl. 464-70.000.
Bartenbach, Christian. Protection device against solar light. 4,517,960, Cl. 126-440.000.
Barth, Gerald D., to Illinois Tool Works Inc. Rotary fastener. 4,518,294, Cl. 411-188.000.
Bartholomaus, Reiner; and Gibas, Christoph, to Mannesmann Rexroth GmbH. Solenoid having low-friction coating internally of the armature sleeve. 4,518,938, Cl. 335-262.000.
Bartnik, Friedhelm; Schindler, Joachim; Weiss, Albrecht; and Schmid, Rolf, to Henkel Kommanditgesellschaft auf Aktien. Acid stable protease from mutants of genus Aspergillus. 4,518,697, Cl. 435-254.000.
Barton, Jerry M.; Long, Don W.; and Lotts, Kenneth D., to American Cyanamid Company. Process for the preparation of 2-(5,5-disubstituted-4-oxo-2-imidazolin-2-yl)nicotinic acids and quinoline-3-carboxylic acids. 4,518,780, Cl. 546-167.000.
BASF Aktiengesellschaft: *See*—
Eckhardt, Heinz; Halbritter, Klaus; and Rohr, Wolfgang, 4,518,785, Cl. 549-453.000.
Ernst, Hansgeorg; Vogel, Friedrich; and Paust, Joachim, 4,518,813, Cl. 570-241.000.
Naarmann, Herbert; Muench, Volker; Kohler, Gernot; and Simak, Petr, 4,518,535, Cl. 260-438.100.
Schirmer, Ulrich; Plath, Peter; and Wuerzer, Bruno, 4,518,414, Cl. 71-90.000.
Basile, Philip C., to RCA Corporation. Transceiver having collision detection capability for contention-formatted FDM local area networks. 4,519,074, Cl. 370-124.000.
Basso, Peter J. Insulated modular cooler. 4,517,815, Cl. 62-457.000.
Bateson, Paul F.: *See*—
Drake, Cyril F.; Maries, Alan; and Bateson, Paul F., 4,518,429, Cl. 106-14.390.
Batorewicz, Wadim; and Wheeler, Edward L., to Uniroyal, Inc. Process for the preparation of p-nitrosodiphenylamine. 4,518,803, Cl. 564-410.000.
Batra, Tarsaim L., to American Microsystems, Incorporated. Method for fabricating MOS device with self-aligned contacts. 4,517,729, Cl. 29-571.000.
Battenfeld Extrusionstechnik GmbH: *See*—
Schafer, Heinrich, 4,517,858, Cl. 74-801.000.
Battiston, Joseph, Jr.: *See*—
Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., 4,518,002, Cl. 135-67.000.

Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., to Tubular Fabricators Ind., Inc. Foldable walker with plunger actuated latch assembly. 4,518,002, Cl. 135-67.000.

Bauer, Hannsgeorg: *See*—
Schudlich, Kurt; Vielstich, Gunter; Muhlenbeck, Josef; Otto, Josef; Bauer, Hannsgeorg; Zollner, Dieter H.; and Rittmann, Friedrich, 4,518,365, Cl. 445-67.000.

Baxter Technologies Inc.: *See*—
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Baxter, Ward, II: *See*—
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.

Bayer Aktiengesellschaft: *See*—
Baasner, Bernd; Hagemann, Hermann; and Klauke, Erich, 4,518,812, Cl. 568-946.000.
Brandes, Wilhelm; and Daum, Werner, 4,518,605, Cl. 514-383.000.
Breidenbach, Peter; Hurnik, Helmut; and Pedain, Josef, 4,518,729, Cl. 524-101.000.
Forster, Heinz; Klauke, Erich; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,518,416, Cl. 71-94.000.
Heusch, Rudolf; Rasshofer, Werner; Reichmann, Wolfgang; and Richartz, Adolf, 4,518,521, Cl. 252-188.310.
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,518,600, Cl. 514-256.000.
Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,743, Cl. 525-80.000.
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,515, Cl. 525-79.000.
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Riberi, Bernd; and Frohlich, Jurg, 4,518,761, Cl. 528-67.000.
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Bayerische Motoren Werke AG: *See*—
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Bayerische Motoren Werke A.G.: *See*—
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Bays, David E.: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; Carey, Linda; and Blatcher, Philip, 4,518,598, Cl. 514-212.000.

Bazuin, Johannes, to LeBlond Makino Machine Tool Co. Steadyrest for slant bed lathe. 4,517,866, Cl. 82-39.000.

BBC Brown, Boveri & Company, Limited: *See*—
Albrecht, Joachim; and Duerig, Thomas, 4,518,444, Cl. 148-402.000.
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Bean, Jackie E.: *See*—
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Beaudet, Leo A.: *See*—
Fotland, Richard A.; and Beaudet, Leo A., 4,518,468, Cl. 204-38.300.

Becker, Kunibert; Kirchbrucher, Rudiger; and Pohlmann, Klaus D., to Gewerkschaft Eisenhutte Westfalia. Mine roof supports. 4,518,284, Cl. 405-296.000.

Beckett, Joel M., to Marq Packaging Systems, Inc. Programmable case sealing machine. 4,517,784, Cl. 53-75.000.

Beckman Instruments, Inc.: *See*—
Stephens, Donald E., 4,518,700, Cl. 436-52.000.

Beckman, Orval E., to Zenith Radio Corporation. Demodulator having two phase shift networks for wide band television audio. 4,518,997, Cl. 358-198.000.

Beckmann, Norbert, to Ford Motor Company. Fastening clip for motor vehicle trim. 4,517,710, Cl. 24-453.000.

Beckmann, Wolfgang: *See*—
Weber, Karl-Heinz; Beckmann, Wolfgang; and Gebauer, Hartmut, 4,518,285, Cl. 405-302.000.

Becton Dickinson and Company: *See*—
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Bedenbender, John W.; and Kelly, Gilbert H., deceased, to Texas Instruments Incorporated. Force or pressure feedback control for seismic vibrators. 4,519,053, Cl. 367-190.000.

Beecham Group Limited: *See*—
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Beem, W. Wayne: *See*—
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Begle, Guntram: *See*—
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Belanger, Thomas D., Jr.: *See*—
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Belani, Jadish G.: *See*—
Goodrich, Gary B.; and Belani, Jadish G., 4,518,735, Cl. 524-403.000.

Bell, John L., to Burroughs Corporation. Method of initializing and recovering from failures in a local area network. 4,519,070, Cl. 370-88.000.

Belt, Robert. Cooking apparatus for pickup trucks. 4,518,189, Cl. 296-22.000.

Belter, Jerome G., to Dana Corporation. Multi-thickness fire ring assembly. 4,518,168, Cl. 277-235.00B.

Bengtsson, Sigurd W., to AB Fixfabriken. Locking device. 4,518,178, Cl. 292-8.000.

Benjamin, Lawrence; Rodriguez, Sheila S.; and Meinberg, Nancy A., to Procter & Gamble Company, The. Animal litter composition. 4,517,919, Cl. 119-1.000.

Benson, Robert D. Windshield washer apparatus. 4,517,704, Cl. 15-250.040.

Bentley, Arthur C.: *See*—
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Bergwerksverband GmbH: *See*—
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Berken, George A.: *See*—
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Berkman Industries, Inc.: *See*—
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Berkman, Joseph L., to Berkman Industries, Inc. Storage system for either boxed or unboxed cassettes. 4,518,084, Cl. 206-387.000.

Bert, Jack A.; and Olsen, R. Eric, to Chevron Research Company. Dynamic methods and apparatus for reducing octane requirement increase. 4,517,943, Cl. 123-415.000.

Bertocci, Guido; and Walters, Stephen M., to AT&T Bell Laboratories. Bit compression multiplexer. 4,519,073, Cl. 370-118.000.

Bertolini, Guglielmo: *See*—
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Better Semiconductor Processes (BSP): *See*—
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Beversdorf, Wallace D.; Erickson, Lawrence R.; and Grant, Ian, to University of Guelph. Hybridization process utilizing a combination of cytoplasmic male sterility and herbicide tolerance. 4,517,763, Cl. 47-58.000.

Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method for producing glass fiber. 4,518,408, Cl. 65-6.000.

Bialas, Volker: *See*—
Brankamp, Klaus; Bialas, Volker; and Bongartz, Heinz B., 4,519,040, Cl. 364-474.000.

Bianchin, Bernard: *See*—
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Biedermann, Jurgen; Prop, Gerrit; and Doppelfeld, Ilie-Stephanie, to A. Nattermann & Cie GmbH. Process for producing (-)-2-[1-(2,6-dichlorophenoxy)-ethyl]-1,3-diazacyclopent-2-ene. 4,518,783, Cl. 548-353.000.

Bigbee, Marvin L.: *See*—
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Bigret, Roland, to Alsthom-Atlantique. Device for applying imbalance to a rotor. 4,517,822, Cl. 73-1.00B.

Bilgutay, Ilhan M. Four function vital sign monitor. 4,517,986, Cl. 128-671.000.

Bilimoria, Bomi M.; and May, Anthony A., to Anglo-American Clays Corporation. Beneficiation of clays by froth flotation. 4,518,491, Cl. 209-166.000.

Billard, Alain A.; and Santalucia, Andre R., to Etienne LaCroix - Tous Artifices. Electromagnetic decoy launching device, in particular for an aircraft. 4,517,896, Cl. 102-342.000.

Binks Manufacturing Company: *See*—
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Bio-Rad Laboratories, Inc.: *See*—
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Bisabri-Ershadi, Barat: *See*—
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Bisping, Heinz: *See*—
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Biswas, Dipak R.; and Nath, Dilip K., to International Telephone and Telegraph Corporation. Hermetic coating by heterogeneous nucleation thermochemical deposition. 4,518,628, Cl. 427-55.000.

Bitsch, Hans-Ulrich. Seating piece of furniture. 4,518,202, Cl. 297-452.000.

Bjorkholm, John E., to AT&T Bell Laboratories. Light induced etching of InP by aqueous solutions of H_3PO_4. 4,518,456, Cl. 156-626.000.

Black, Philip W.; and Irven, John, to International Standard Electric Corporation. Optical fibre preform manufacture. 4,518,407, Cl. 65-3.120.

Black, Robert H.: *See*—
Green, Arthur A.; and Black, Robert H., 4,518,506, Cl. 210-747.000.

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Blanchette, Henry J., to Plastican, Inc. Mold for forming a container having a pivot means. 4,518,143, Cl. 249-142.000.

Bland, Gerald F.; and Sullivan, Donald K., to Outboard Marine Corporation. Vent assembly for marine propulsion devices. 4,518,363, Cl. 440-89.000.

Blande, Carl-Axel: *See*—
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Blatcher, Philip: *See*—
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Blatchford, Michael I., to Ralph Blatchford & Company Limited. Load handling apparatus. 4,518,304, Cl. 414-542.000.

Blatt, Leland F.; and Crorey, David J., to Leland F. Blatt. Parallel movement gripper head. 4,518,187, Cl. 294-88.000.

Bleggi, Joseph N. Boat railing mounted fishing rod holder. 4,517,761, Cl. 43-21.200.

Bloch, Joseph T., to Boeing Company, The. Compliant robot arm adapter assembly. 4,518,307, Cl. 414-729.000.

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Bloor, Trevor J.; and Walton, Lawrence J. Solar water heating apparatus. 4,517,961, Cl. 126-450.000.

Bloxom, Ingrid B., Jr. Apparatus for colonic and intestinal irrigation. 4,518,382, Cl. 604-27.000.

Blum, Patricia R.; Milberger, Ernest C.; and Nicholas, Mark L., to Standard Oil Company, The. Method for adding make-up fluid bed oxidation catalysts for fluid bed oxidation catalysts containing the mixed oxides of vanadium and phosphorus. 4,518,523, Cl. 502-209.000.

Board of Regents, The University of Texas System: *See*—
Cuff, George W.; and McGinity, James W.; 4,518,547, Cl. 264-4.700.

Bochtler, Franz: *See*—
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Boden, Richard M., to International Flavors & Fragrances Inc. 3,4,5,6,6-Pentamethyl hexanol-2 and alkyl homologues thereof; process for preparing same and organoleptic uses thereof. 4,517,990, Cl. 131-276.000.

Boden, Richard M., to International Flavors & Fragrances Inc. 3,4,5,6,6-Pentamethyl hexanol-2 and alkyl homologues thereof; process for preparing same and organoleptic uses thereof. 4,517,991, Cl. 131-276.000.

Boeckmann, Eduard F. B., to GTE Communications Systems Corporation. Two terminal microphone active load gain regulation circuit. 4,518,829, Cl. 179-81.00B.

Boeing Company, The: *See*—
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Bloch, Joseph T., 4,518,307, Cl. 414-729.000.
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Fenner, James A., 4,518,179, Cl. 292-166.000.

Boger, David L.; Pugh, Jerry T.; and Zuidema, Jack, to Miles Laboratories, Inc. Reagent test device holder. 4,518,565, Cl. 422-58.000.

Bogner, Richard D., to King, Leonard H. Vertically polarized omnidirectional antenna. 4,518,969, Cl. 343-819.000.

Bohl, Thomas L., to Babcock & Wilcox Company, The. On-line coal analyzer. 4,518,699, Cl. 436-49.000.

Bohm, Jurgen, to Bopp & Reuther GmbH. Testing device for flowmeter. 4,517,823, Cl. 73-3.000.

Boig, Robert W.: *See*—
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Boll & Kirch, Filterbau GmbH, Firma: *See*—
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Bolze, Rudolf; Geiger, Friedhelm; Spindler, Manfred; and Tanner, Herbert. Process for the hydrolysis of 5-(β-methylmercaptoethyl)-hydantoin. 4,518,801, Cl. 562-559.000.

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Bongartz, Heinz B.: *See*—
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Bonicalzi, Leopold: *See*—
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Booth, Michael R.: *See*—
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Bopp & Reuther GmbH: *See*—
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Borg-Warner Chemicals, Inc.: *See*—
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Borg-Warner Corporation: *See*—
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Borg-Warner Limited: *See*—
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Born, Gerald W.: *See*—
Anway, Kenneth L.; and Born, Gerald W., 4,518,558, Cl. 264-515.000.

Bornemann, Hans-Joachim; and Zlab, Horst, to Thyssen Industrie Aktiengesellschaft. Mixer for continuously mixing granular to powdery materials. 4,518,262, Cl. 366-156.000.

Borning, Jeffrey M.: *See*—
Breske, Carl D.; and Borning, Jeffrey M., 4,518,110, Cl. 228-20.000.

Borrelli, Nicholas F.; and Trotter, Donald M., to Corning Glass Works. Optical device and method. 4,518,222, Cl. 350-167.000.

Bortz, Botho; and Wulfes, Erwin, to Volkswagenwerk Aktiengesellschaft. Energy-dissipatingly flexible knee-restraining element. 4,518,172, Cl. 280-751.000.

Bosco, Peter M.: *See*—
Wilson, Mildred N.; Danielson, Robert L.; Bosco, Peter M.; and Steensen, Wayne L., 4,518,622, Cl. 426-578.000.

Bossler, Robert B., Jr., to Western Gear Corporation. Method of face mill generation of spiral bevel gears with integral central structure and resulting product. 4,518,287, Cl. 409-26.000.

Bottenbruch, Ludwig: *See*—
Stix, Wolfgang; Bottenbruch, Ludwig; and Neuray, Dieter, 4,518,747, Cl. 525-462.000.

Boutevin, Bernard; Deiss, Willy-Jean; Maliszewicz, Marc; and Pietrasanta, Yves, to Societe de Vente de l'Aluminium Pechiney. Telomers which can be cross-linked by light. 4,518,794, Cl. 560-192.000.

Bowden, Edgar A., to Mobil Oil Corporation. Power control circuit. 4,519,011, Cl. 360-137.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D., 4,517,881, Cl. 98-208.000.

Boysen, Lennart; and Ottoson, Ulf. Crushers. 4,518,125, Cl. 241-141.000.

Bozler, Carl O.: *See*—
Leonberger, Frederick J.; Melngailis, Ivars; Bozler, Carl O.; and McClelland, Robert W., 4,518,219, Cl. 350-96.120.

Brachman, Dina I.: *See*—
Eigen, Edward; Twersky, David Z.; and Brachman, Dina I., 4,518,517, Cl. 252-107.000.

Brackman, Warren A.; and Snaidr, Stanislav M. Feeding tobacco cutting machines. 4,517,988, Cl. 131-116.000.

Bradley, James D.; and Amundson, Gregg B., to Magnetic Controls Company. Printed circuit board card cage. 4,519,016, Cl. 361-415.000.

Brady, William C.: *See*—
Perkins, Richard A.; Brady, William C.; and Glaser, Hellmut I., 4,518,406, Cl. 65-1.000.

Braese, Hans-Eberhard: *See*—
Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,743, Cl. 525-80.000.
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,515, Cl. 525-79.000.

Braginsky, Yakov I.; Gultsev, Igor V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; and Yaroshenko, Yury F., to Vsesojuzny Nauchno-Issledovatelsky I Exerimentalno-Konstruktorsky Institut Prodovol-Stvennogo Mashinostroenia. Apparatus for recovering meat of small crustaceans. 4,517,707, Cl. 17-71.000.

Braithwaite, David, to Emhart Industries, Inc. Parison screening in a glassware forming machine. 4,518,412, Cl. 65-244.000.

Branca, Virgilio, to Somiver s.r.l. Apparatus for forming centrifuged poles. 4,518,342, Cl. 425-435.000.

Brand, Erich: *See*—
Lochner, Kaspar; Schurmann, Helmut; and Brand, Erich, 4,518,513, Cl. 252-62.000.

Brandeau, Edward P., to Thomas & Betts Corporation. Wire termination system and terminator therefor. 4,518,216, Cl. 339-97.00P.

Brandes, Wilhelm; and Daum, Werner, to Bayer Aktiengesellschaft. Fungicidal azole-substituted oximino-cyano-acetamide derivatives. 4,518,605, Cl. 514-383.000.

Brandes, Wilhelm: *See*—
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,518,600, Cl. 514-256.000.

Branham, Doud R., to International Game Technology. Coin handling apparatus. 4,518,001, Cl. 133-5.00R.

Brankamp, Klaus; Bialas, Volker; and Bongartz, Heinz B., to Brankamp, Klaus. Method for detecting and recognizing deviations of cyclically recurring processes for the shaping of workpieces. 4,519,040, Cl. 364-474.000.

Brase, Ingrid E.: *See*—
Gleason, Patricia A.; and Brase, Ingrid E., 4,518,510, Cl. 252-8.50C.

Breeze, Gerald D.; and Elliott, Donald C., to General Electric Company, p.l.c., The. Assemblies of electrical or electronic apparatus. 4,519,013, Cl. 361-384.000.

Breidenbach, Peter; Hurnik, Helmut; and Pedain, Josef, to Bayer Aktiengesellschaft. Solutions of isocyanato-isocyanurates in plasticizers for polyvinyl chloride, a process for their production and their use as adhesion-improving additives in coating compositions based on plasticized polyvinyl chloride. 4,518,729, Cl. 524-101.000.

Breitfeld & Schliekert GmbH: *See*—
Kopp, Hubert, 4,517,870, Cl. 83-411.00R.

Brennan, John F., to UOP Inc. Catalyst for the reduction of nitrogen oxides in gaseous mixtures and method of making the catalyst. 4,518,710, Cl. 502-309.000.

Breske, Carl D.; and Borning, Jeffrey M., to Control Data Corporation. Device for soldering/desoldering apertured lendless packages. 4,518,110, Cl. 228-20.000.

Bresson, Clarence R.; and Kimble, Kenneth B. Ore flotation with combined collectors. 4,518,492, Cl. 209-166.000.

Brichta, Corrado: *See*—
Zamboni, Valentino; Brichta, Corrado; and Troglia, Claudio, 4,518,731, Cl. 524-166.000.

Bridgestone Tire Company Limited: *See*—
Matsunuma, Tamotsu, 4,518,024, Cl. 152-361.0DM.
Yamaguchi, Yutaka; Koizumi, Nobuyuki; Hirano, Masami; Araki, Tamio; and Kojima, Koichi, 4,518,023, Cl. 152-361.0FP.

Bridson, Robert C.: *See*—
Wedge, Philip J.; and Bridson, Robert C., 4,518,348, Cl. 431-265.000.

Brinkerhoff, Jesse R.; and Brinkerhoff, Richard S., to Telecalc, Inc. Telephone interconnect detection system. 4,518,825, Cl. 179-11.000.

Brinkerhoff, Richard S.: *See*—
Brinkerhoff, Jesse R.; and Brinkerhoff, Richard S., 4,518,825, Cl. 179-11.000.

Brinkmann, Egon; Putenat, Mandred; and Dorre, Erhard, to Fedlmuhle Aktiengesellschaft. Fastening system for mucous membrane-supported denture. 4,518,357, Cl. 433-173.000.

Bristol-Myers Company: *See*—
Cundall, Robert L.; and Walker, Derek, 4,518,773, Cl. 544-16.000.
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,518,589, Cl. 514-27.000.

British Gas Corporation: *See*—
Wedge, Philip J.; and Bridson, Robert C., 4,518,348, Cl. 431-265.000.

Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Cyclic compounds. 4,518,784, Cl. 549-39.000.

Brockmueller, Bernd, to PPG Industries, Inc. Storing bending molds. 4,518,410, Cl. 65-106.000.

Brodeur, Jacques; and Brodeur, Mireille. Computer assisted symmetrical analysis for hair stylists. 4,519,037, Cl. 364-400.000.

Brodeur, Mireille: *See*—
Brodeur, Jacques; and Brodeur, Mireille, 4,519,037, Cl. 364-400.000.

Brody, Harry, to Imperial Chemical Industries PLC. Process of melt spinning of a blend of a fibre-forming polymer and an immiscible polymer and melt spun fibres produced by such process. 4,518,744, Cl. 525-184.000.

Broersma, Harmen. Colour analyser. 4,518,258, Cl. 356-405.000.

Bronner, Jean-Claude, to CEM Compagnie Electro-Mecanique. Method and apparatus for minimizing the power induced in a flat conducting product maintained in position electromagnetically without contact. 4,518,840, Cl. 219-10.670.

Brookman, Donald L.: *See*—
Grollimund, Everett C.; Smick, William H., III; and Brookman, Donald L., 4,517,825, Cl. 73-38.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirata, Yoshikatsu, 4,518,271, Cl. 400-636.100.

Brouillette, Bruce R.; and Shafer, Martha J., to Rust-Oleum Corporation. Water based aerosol coatings. 4,518,734, Cl. 524-378.000.

Brown, Boveri & Cie. AG.: *See*—
Gillhaus, Horst; Hegewaldt, Fritz; Faber, Wolfgang; Baer, Jurgen; and Toplak, Ernst, 4,518,352, Cl. 432-199.000.

Brown, Herbert C.: *See*—
Kramer, George M.; Weissman, Walter; Brown, Herbert C.; and Pettit, Rowland, deceased, 4,518,798, Cl. 560-233.000.

Brown International Corporation: *See*—
Alexander, L. Bruce, 4,518,621, Cl. 426-495.000.

Brown, Joe R. High speed pipe handling apparatus. 4,518,309, Cl. 414-745.000.

Brown, Michael K.; and Rabiner, Lawrence R., to AT&T Bell Laboratories. LPC Word recognizer utilizing energy features. 4,519,094, Cl. 381-43.000.

Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Dental respiorative cement pastes. 4,518,430, Cl. 106-35.000.

Brown & Williamson Tobacco Corporation: *See*—
Korte, Kevin R.; and Snyder, Daniel D., 4,517,992, Cl. 131-304.000.
Vester, Rudolph P., 4,517,996, Cl. 131-339.000.

Browne, Edward M.: *See*—
Tantillo, Donnie J.; Kratochvil, David F.; Moore, Robert G.; and Browne, Edward M., 4,519,052, Cl. 367-79.000.

Bruder, Frank J., to Bentley, Arthur C. Exerciser with electrically controlled resistance. 4,518,163, Cl. 272-132.000.

Bryant, David R.: *See*—
Abatjoglou, Anthony G.; and Bryant, David R., 4,518,805, Cl. 568-444.000.

Brym, Stanley J.; and Valbona, Bruno M., to Dynamics Corporation of America. Splatter shield for use with a drink mixer. 4,518,263, Cl. 366-206.000.

Buckbee Mears Company: *See*—
Thoms, Roland, 4,518,892, Cl. 313-403.000.

Buckner, Arthur B.; Davies, Michael L.; and Weber, Lawrence W., to Sperry Corporation. Fan mounting assembly. 4,517,880, Cl. 98-1.000.

Bucko, Thomas G.: *See*—
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.

Bucourt, Francois, to Aluminium Pechiney. Process and apparatus for obtaining stackable auto-clamping blocks. 4,518,028, Cl. 164-460.000.

Budinger, A. Bowman: *See*—
Proud, Joseph M.; Budinger, A. Bowman; Riseberg, Leslie A.; and Byszewski, Wojciech W., 4,518,897, Cl. 315-260.000.

Buechler, Lawrence W.: *See*—
Fenster, Abraham S.; and Buechler, Lawrence W., 4,518,008, Cl. 137-552.000.

Burgio di Aragona, Antonio, to Fiat Auto S.p.A. Tappet for internal combustion engines with variable profile camshafts. 4,517,936, Cl. 123-90.500.

Burkhardt, Terry J.: *See*—
Schulz, Donald N.; Kitano, Kissho; Burkhardt, Terry J.; and Langer, Arthur W., 4,518,757, Cl. 526-329.000.

Burns, Eugene A.; and Colby, Bruce N., to Maxwell Laboratories, Inc. Method of extracting organic contaminants from process waters. 4,518,502, Cl. 210-634.000.

Burroughs Corporation: *See*—
Andreadakis, Nicholas C., 4,518,894, Cl. 313-491.000.
Bell, John L., 4,519,070, Cl. 370-88.000.
Chamberlain, John T., 4,519,035, Cl. 364-200.000.
Clark, Becky J., 4,518,960, Cl. 340-825.020.
Fuchs, Otto, 4,518,940, Cl. 335-285.000.
Sellars, Graham P., 4,519,007, Cl. 360-77.000.

Bush, Harold G.; and Wallsom, Richard E., to United States of America, National Aeronautics and Space Administration. Self-locking mechanical center joint. 4,518,277, Cl. 403-102.000.

Bush, Phillip V.: *See*—
Pontius, Duane H.; and Bush, Phillip V., 4,518,401, Cl. 55-101.000.

Bussing, Jurgen; and Muller, Hubert, to Ciba Geigy Corporation. Solid stabilizer composition. 4,518,732, Cl. 524-178.000.

Butenop, Klaus; and Singer, Klaus-Peter, to Autoflug GmbH. Inertial element for winding the safety belt of a motor vehicle. 4,518,131, Cl. 242-107.40B.

Byszewski, Wojciech W.: *See*—
Proud, Joseph M.; Budinger, A. Bowman; Riseberg, Leslie A.; and Byszewski, Wojciech W., 4,518,897, Cl. 315-260.000.

Cabot Corporation: *See*—
Stewart, Harvey; and Mosheim, C. Edward, 4,518,570, Cl. 423-63.000.

Calandra, Frank, Jr., to Jennmar Corporation. Method and apparatus for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,518,292, Cl. 411-82.000.

Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., to Texas Instruments Incorporated. Electronic data processing apparatus with equation operating system having improved unary operation implementation. 4,519,045, Cl. 364-709.000.

Caldwell Manufacturing Company: *See*—
Haltof, Garry P., 4,517,766, Cl. 49-417.000.

Calhoun, L. Owen, to W. C. Pursley Limited. Trenchduct side member extrusion adapted for multiple positioning of cover plate. 4,517,777, Cl. 52-126.200.

Calmettes, Lionel; and Andre, Michel, to Establissements Caillau. Clamp. 4,517,708, Cl. 24-20.0CW.

Cameron Iron Works, Inc.: *See*—
Vicic, John C.; La Velle, Carl A.; and Parris, Joe P., III, 4,518,144, Cl. 251-1.00A.

Campbell, Frank P. Auxiliary closet system. 4,518,089, Cl. 211-118.000.

Campbell, Willis R.; and Walker, James D., to Sperry Corporation. Twine wrapping apparatus for a roll baling machine. 4,517,890, Cl. 100-5.000.

Campbell, Willis R.: *See*—
Walker, James D.; Underhill, Kenneth R.; and Campbell, Willis R., 4,517,889, Cl. 100-5.000.

Camph, Sven E. Automatic slack adjuster. 4,518,063, Cl. 188-196.0BA.

Canada Wire and Cable Limited: *See*—
Vokey, David E., 4,518,034, Cl. 156-54.000.

Canadas, Jean C.; and Vigo, Gilles, to Compagnie Industrielle de Mecanismes en abrege C.I.M. Sun-glare shield in particular for an automobile vehicle. 4,518,192, Cl. 296-97.00H.

Canon Kabushiki Kaisha: *See*—
Misumi, Teruo; and Osato, Yoichi, 4,518,671, Cl. 430-84.000.
Sugiura, Muneharu, 4,518,228, Cl. 350-427.000.
Tazaki, Shigemitsu, 4,518,973, Cl. 346-140.00R.
Toyama, Masamichi, 4,518,242, Cl. 354-403.000.
Urawa, Motoo; and Imai, Eiichi, 4,518,672, Cl. 430-106.000.
Yashiki, Yuichi, 4,518,669, Cl. 430-57.000.

Cantu, Terry S.: *See*—
Pace, Gerald F.; and Cantu, Terry S., 4,518,393, Cl. 44-6.000.

Carey, Linda: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; Carey, Linda; and Blatcher, Philip, 4,518,598, Cl. 514-212.000.

Caris, Marcel. Device for the electric connection of a cylindrical conductor. 4,518,214, Cl. 339-74.00R.

Carl-Zeiss-Stiftung: *See*—
Muchel, Franz; and Strahle, Fritz, 4,518,231, Cl. 350-516.000.
Weber, Klaus, 4,518,230, Cl. 350-511.000.

Carnes, Ronald C.: *See*—
Thompson, Craig R.; Carnes, Ronald C.; and Naumann, Ted F., Jr., 4,517,840, Cl. 73-644.000.

Carstensen, Hans-Peter: *See*—
Krappitz, Heinz; Carstensen, Hans-Peter; and Weinhold, Friedrich, 4,517,829, Cl. 73-49.800.

Carter, Thomas P.; Schinner, Edward N.; Harrison, Richard H., Jr.; and Cates, Robert E., to Baltimore Aircoil Company, Inc. Serpentine film fill packing for evaporative heat and mass exchange. 4,518,544, Cl. 261-112.000.

Carus, Edmund H.; and White, Eric F. T., to Vernon-Carus Limited. Radio opaque fibre. 4,517,793, Cl. 57-243.000.

Cascini, Michael R.: *See*—
Fredrickson, Lee R.; Cascini, Michael R.; and Mosier, Donald E., 4,518,225, Cl. 350-338.000.

Casparian, Robert E.: *See*—
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,518,458, Cl. 159-47.100.

Cass, James L., to Perkins Research & Mfg. Co., Inc. Cable test apparatus. 4,518,911, Cl. 324-52.000.

Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; and Greiner, Ulrich, 4,518,745, Cl. 525-326.600.

Castelluzzo, James M. Knife with plural replaceable blade storage and means for single blade extension. 4,517,741, Cl. 30-162.000.
Caterpillar Tractor Co.: *See—*
Mitchell, Thomas L.; McMahill, Patrick D.; Valbert, Gary G.; and Wellauer, John C., 4,518,276, Cl. 403-13.000.
Sandroni, Gianni, 4,517,819, Cl. 72-353.000.
Cates, Robert E.: *See—*
Carter, Thomas P.; Schinner, Edward N.; Harrison, Richard H., Jr.; and Cates, Robert E., 4,518,544, Cl. 261-112.000.
Catros, Jean Y., to Thomson-CSF. Differential data coding and decoding process and system restricting propagation of transmission errors. 4,519,085, Cl. 375-27.000.
Caudill, Eddie T.; Caudill, Richard T.; and Conley, Lyle N., to Mountain Systems, Inc. Vandal-proof communication system. 4,518,826, Cl. 179-37.000.
Caudill, Richard T.: *See—*
Caudill, Eddie T.; Caudill, Richard T.; and Conley, Lyle N., 4,518,826, Cl. 179-37.000.
Cavazza, Claudio; and Tinti, Maria O. Thioalkanoyl-carnitines, process for their preparation and mucolytic pharmaceutical compositions containing same. 4,518,613, Cl. 514-513.000.
Cavezzan, Jacques; and Prud'Homme, Christian, to Rhone-Poulenc Specialites Chimiques. Organopolysiloxane/polyurethane elastomeric block copolymers. 4,518,758, Cl. 528-12.000.
Cecere, Andrew P.: *See—*
Diggle, Edmund A., Jr.; and Cecere, Andrew P., 4,517,712, Cl. 26-51.400.
Celotex Corporation, The: *See—*
Frentzel, Richard L., 4,518,719, Cl. 521-136.000.
CEM Compagnie Electro-Mecanique: *See—*
Bronner, Jean-Claude, 4,518,840, Cl. 219-10.670.
Central Soya Company, Inc.: *See—*
Monagle, Charles W., and Smith, Janet C., 4,518,620, Cl. 426-291.000.
Centre Technique de L'Industrie des Papiers, Cartons et Celluloses: *See—*
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, 4,518,499, Cl. 210-332.000.
Centre Technique de l'Industrie Horlogere "Cetehor": *See—*
Chatelain, Jean C., 4,518,884, Cl. 310-49.000.
Cerny, Frank J., Jr., to Motorola, Inc. Large dynamic range multiplier for a maximal-ratio diversity combiner. 4,519,096, Cl. 455-137.000.
Cetus Corporation: *See—*
Mark, David F.; Lin, Leo S.; and Lu, Shi-Da Y., 4,518,584, Cl. 424-85.000.
Challenge-Cook Brothers, Inc.: *See—*
Gould, Bruce M., 4,517,888, Cl. 99-472.000.
Chamberlain, John T., to Burroughs Corporation. Branched-spiral wafer-scale integrated circuit. 4,519,035, Cl. 364-200.000.
Champeau, Kenneth L.: *See—*
Youngblood, Harold C.; and Champeau, Kenneth L., 4,518,037, Cl. 166-125.000.
Champion International Corporation: *See—*
Roccaforte, Harry I., 4,518,086, Cl. 206-485.000.
Chan, Rebecca L. S.: *See—*
Dawson, Marcia I.; and Chan, Rebecca L. S., 4,518,609, Cl. 514-448.000.
Charchanko, Eugene W.: *See—*
Lenaerts, George V.; Charchanko, Eugene W.; and Dambenieks, Andrejs, 4,517,739, Cl. 29-846.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Consales, Emanuel J.; and Kondoleon, Anthony, 4,517,744, Cl. 33-169.00C.
Charlton Associates: *See—*
Elliott, Richard J., 4,517,772, Cl. 51-281.0SF.
Charron, Jean-Claude. Pressure responsive cap for gas appliances. 4,518,003, Cl. 137-65.000.
Chastain, Charles E.; and King, Donald R., to PRM Energy Systems, Inc. Particulate waste product combustion system. 4,517,905, Cl. 110-346.000.
Chatelain, Jean C., to Centre Technique de l'Industrie Horlogere "Cetehor". Step motor particularly for electronic timepieces. 4,518,884, Cl. 310-49.000.
Chem-Technics, Inc.: *See—*
Conner, Jesse R., 4,518,507, Cl. 210-747.000.
Chemische Werke Huls Aktiengesellshcaft: *See—*
Disteldorf, Josef; and Flakus, Werner, 4,518,740, Cl. 524-783.000.
Chen, Clay T.; Wan, K. Ming; and Chen, Mary S., to Hatco Chemical Corporation. Process for preparing N-benzyloxycarbonyl-L-aspartic acid. 4,518,792, Cl. 560-163.000.
Chen, Li-Fu. Apparatus for automatically measuring height. 4,518,052, Cl. 177-245.000.
Chen, Mary S.: *See—*
Chen, Clay T.; Wan, K. Ming; and Chen, Mary S., 4,518,792, Cl. 560-163.000.
Chen, Nai Y.: *See—*
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Stephen S., 4,518,485, Cl. 208-89.000.
Chen, Sow-Mei L.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,518,790, Cl. 560-118.000.
Chen, William I. H.: *See—*
Rozema, John G.; and Chen, William I. H., 4,518,930, Cl. 331-36.00C.
Cherukuri, Subraman R.; Marschall-Helman, Ellen; and Hriscisce, Frank T., to Warner-Lambert Company. Non-adhesive chewing gum base composition. 4,518,615, Cl. 426-4.000.
Chevron Research Company: *See—*
Bert, Jack A.; and Olsen, R. Eric, 4,517,943, Cl. 123-415.000.
Sollie, Steinar; and Andresen, Arild A., 4,518,050, Cl. 175-250.000.
Sollie, Steinar; and Andresen, Arilo A., 4,518,051, Cl. 175-250.000.
Chicago Bridge & Iron Company: *See—*
Korzonas, Raymond, 4,517,806, Cl. 62-123.000.
Chicopee: *See—*
Wang, Robert C.; Sampson, Arthur J.; and Persinko, Mark M., 4,518,649, Cl. 428-284.000.
Childress, J. Phillip. Taco shell frying mold. 4,517,887, Cl. 99-426.000.
Chin, Herbert A., to United Technologies Corporation. Method of producing columnar crystal superalloy material with controlled orientation and product. 4,518,442, Cl. 148-11.50N.
CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.
Chisholm, William M.; and Thompson, Fred E., to AT&T Technologies, Inc. Multi-purpose transport tray. 4,518,085, Cl. 206-454.000.
Chiu, Herman S., to Union Carbide Corporation. Preparation of smoke treated, stuffed food casings. 4,518,619, Cl. 426-265.000.
Cho, Hyun S.: *See—*
Gigl, Paul D.; and Cho, Hyun S., 4,518,659, Cl. 428-539.500.
Chouanard, Harvey J.: *See—*
Skovran, Daniel G.; Shockley, Brett A.; and Chouanard, Harvey J., 4,519,014, Cl. 361-397.000.
Chow, Laurence C.: *See—*
Brown, Walter E.; and Chow, Laurence C., 4,518,430, Cl. 106-35.000.
Chr. Hansen's Laboratory, Inc.: *See—*
Gehrman, Sybil H.; and Porubcan, Randolph S., 4,518,696, Cl. 435-253.000.
Christian, J. Vernon. Control circuit for a solid fuel furnace. 4,517,902, Cl. 110-190.000.
Christidis, Yani: *See—*
Schouteeten, Alain; and Christidis, Yani, 4,518,800, Cl. 562-459.000.
Chryso S.A.: *See—*
Guicquero, Jean P., 4,518,725, Cl. 524-3.000.
Chu, Daniel Y. M.: *See—*
Delony, Timothy E.; and Chu, Daniel Y. M., 4,518,476, Cl. 204-299.00R.
Chu, David C.; and Ward, Michael J., to Hewlett-Packard Company. Data capture in an uninterrupted counter. 4,519,091, Cl. 377-44.000.
Chugai Ro Co., Ltd.: *See—*
Banno, Takashi; Seki, Tadashi; Kawaguchi, Masafumi; Tanaka, Yukio; Iwasaki, Morikatsu; and Nagasawa, Toshio, 4,518,353, Cl. 432-205.000.
Ciba-Geigy AG: *See—*
Leppard, David G.; and Rody, Jean, 4,518,679, Cl. 430-372.000.
Leppard, David G.; and Rody, Jean, 4,518,688, Cl. 430-551.000.
Ciba Geigy Corporation: *See—*
Bussing, Jurgen; and Muller, Hubert, 4,518,732, Cl. 524-178.000.
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,518,533, Cl. 260-245.400.
Haug, Theobald; and Stockinger, Friedrich, 4,518,748, Cl. 525-481.000.
Irving, Edward, 4,518,676, Cl. 430-280.000.
Kristiansen, Odd; and Drabek, Jozef, 4,518,601, Cl. 514-340.000.
Krueger, Ulf A.; and Meshako, Thomas M., 4,518,762, Cl. 528-95.000.
Martin, Henry, 4,518,536, Cl. 260-465.00D.
Meyer, Willy; Fory, Werner; and Topfl, Werner, 4,518,776, Cl. 544-206.000.
Mollet, Hans; and Dussy, Paul, 4,518,392, Cl. 8-609.000.
Ciesco, Richard: *See—*
Ellenbaum, Frank H.; and Ciesco, Richard, 4,518,428, Cl. 75-257.000.
Cilindro, Leticia D., to Turco, Loreto. Machinable wax for prototype patterns. 4,518,288, Cl. 409-219.000.
Cimarusti, Robert J.; and Posinger, Stanley A. Bar stock feeding tool. 4,517,722, Cl. 29-234.000.
Citizen Watch Co., Ltd.: *See—*
Osaka, Takatoshi; Nishimura, Katsuo; and Nakagiri, Tadahiko, 4,517,953, Cl. 124-17.000.
CL Industries, Inc.: *See—*
Woodson, Wayne D., 4,518,723, Cl. 523-466.000.
Claassen, George R.: *See—*
Frank, Robert G.; Fecik, Michael T.; and Claassen, George R., 4,518,411, Cl. 65-106.000.
Clabburn, Robin J. T.: *See—*
Larsson, Peter L.; and Clabburn, Robin J. T., 4,518,819, Cl. 174-78.000.
Claes, Constant J. P.: *See—*
Lambrechts, Eric G. Y.; Verhoeven, Herman K. M.; and Claes, Constant J. P., 4,518,160, Cl. 271-214.000.
Clarion Co., Ltd.: *See—*
Niimi, Morihiro, 4,517,728, Cl. 29-571.000.
Clark, Becky J., to Burroughs Corporation. Speed independent selector switch employing M-out-of-N codes. 4,518,960, Cl. 340-825.020.
Clark, Charles W., Jr.: *See—*
West, Harold H.; Johnson, Roger A.; and Clark, Charles W., Jr., 4,518,153, Cl. 254-274.000.

Clark, Larry G. Transaction drawer assembly. 4,517,901, Cl. 109-19.000.

Claude, Timothy J.: *See*—
Timm, Gerald W.; Sandford, Donald L.; and Claude, Timothy J., 4,517,967, Cl. 128-79.000.

Clayton, William J., to Mobil Oil Corporation. Adhesive channel closure for flexible bags. 4,519,095, Cl. 383-86.000.

Clegg, Lynaveta: *See*—
Moser, William H., 4,518,303, Cl. 414-528.000.

Clemence, Francois: *See*—
Allais, Andre ; Clemence, Francois; Deraedt, Roger; and Lemartret, Odile, 4,518,775, Cl. 544-92.000.

Clorox Company, The: *See*—
Hsia, Samson T.; and Ogasawara, Pam, 4,518,618, Cl. 426-262.000.

Clough, John M.: *See*—
Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, 4,518,415, Cl. 71-92.000.

Clymer, Roy E., to Psychologics, Inc. Method of and circuit for simulating neurons. 4,518,866, Cl. 307-201.000.

Coca-Cola Limited: *See*—
Phillips, Stephen J., 4,518,639, Cl. 428-35.000.

Cochran, Harvey B.: *See*—
Smith, Maurice R.; and Cochran, Harvey B., 4,518,760, Cl. 528-48.000.

Cochran, Thomas J.: *See*—
Hottenrott, Hans G.; Hodge, Philo B.; and Cochran, Thomas J., 4,518,910, Cl. 324-158.00P.

Codman & Shurtleff, Inc.: *See*—
Waters, George F., 4,518,223, Cl. 350-254.000.

Coe, Thomas J. Ice suppression mat. 4,518,281, Cl. 405-61.000.

Cohen, Abraham B.: *See*—
Heiart, Robert B.; and Cohen, Abraham B., 4,518,667, Cl. 430-22.000.

Colby, Bruce N.: *See*—
Burns, Eugene A.; and Colby, Bruce N., 4,518,502, Cl. 210-634.000.

Cole, Charles; and Cole, Wayne, to Enercorp Management, Ltd. Apparatus and method for determining the air leakage characteristics of a structure. 4,517,826, Cl. 73-40.000.

Cole, Trevor W. Signal processing apparatus and method. 4,519,046, Cl. 364-822.000.

Cole, Wayne: *See*—
Cole, Charles; and Cole, Wayne, 4,517,826, Cl. 73-40.000.

Coleman, Douglas L.; and Applezweig, Norman, to Jackson Laboratory, The. Method for treating diabetes using DHEA compounds. 4,518,595, Cl. 514-178.000.

Coles Cranes Limited: *See*—
Thomasson, William R., 4,518,090, Cl. 212-189.000.

Colgate-Palmolive Company: *See*—
Eigen, Edward; Twersky, David Z.; and Brachman, Dina L., 4,518,517, Cl. 252-107.000.
Hayes, Harry; and Harvey, Kenneth, 4,518,578, Cl. 424-7.100.

Colvin, Floyd W.: *See*—
Khanna, Pyare L.; and Colvin, Floyd W., 4,518,701, Cl. 436-500.000.

Commissariat a l'Energie Atomique: *See*—
Jeuch, Pierre, 4,518,629, Cl. 427-89.000.
Robert, Andre, 4,518,816, Cl. 174-3.000.
Schnedecker, Guy; and Mougin, Jacques, 4,518,635, Cl. 427-232.000.

Commonwealth of Australia, The: *See*—
Penny, Michael F.; Woodcock, Brian; Abbot, Ralph H.; Phillips, David M.; and Spaans, Leendert B., 4,518,254, Cl. 356-5.000.

Communications Satellite Corporation: *See*—
Snyder, John S., Jr., 4,519,080, Cl. 371-43.000.

Compagnie Francaise des Petroles: *See*—
Lefebvre, Herve M.; and Helderle, Paul M., 4,518,036, Cl. 166-105.000.

Compagnie Generale des Etablissements Michelin: *See*—
Faure, Raymond, 4,517,848, Cl. 73-862.520.

Compagnie Industrielle de Mecanismes en abrege C.I.M.: *See*—
Canadas, Jean C.; and Vigo, Gilles, 4,518,192, Cl. 296-97.00H.

Concast Incorporated: *See*—
Langner, Carl; Poran, Michael; and Szarka, Geza, 4,518,074, Cl. 198-425.000.

Conley, Lyle N.: *See*—
Caudill, Eddie T.; Caudill, Richard T.; and Conley, Lyle N., 4,518,826, Cl. 179-37.000.

Connecticut Artcraft Corporation: *See*—
Viesturs, Eric A., 4,517,693, Cl. 5-451.000.

Conner, Jesse R., to Chem-Technics, Inc. Method for chemically solidifying and encapsulating hazardous wastes in one continuous operation. 4,518,507, Cl. 210-747.000.

Conner, Jesse R., to SolidTek Systems, Inc. Method for treating wastes by solidification. 4,518,508, Cl. 210-751.000.

Conoco Inc.: *See*—
Graf, Harlan G.; and Janssen, Harry R., 4,518,487, Cl. 208-131.000.
Pace, Gerald F.; and Cantu, Terry S., 4,518,393, Cl. 44-6.000.

Consales, Emanuel J.; and Kondoleon, Anthony, to Charles Stark Draper Laboratory, Inc., The. Compliant assembly system with force sensor members. 4,517,744, Cl. 33-169.00C.

Constantinescu, Ion, to Advanced Micro Devices, Inc. TTL-ECL Input translation with AND/NAND function. 4,518,876, Cl. 307-475.000.

Contracap, Inc.: *See*—
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,517,970, Cl. 128-131.000.

Contreras, Joseph P., Sr. Molded container with living hinges. 4,518,092, Cl. 220-20.500.

Control Data Corporation: *See*—
Breske, Carl D.; and Borning, Jeffrey M., 4,518,110, Cl. 228-20.000.

Control Process, Inc.: *See*—
Kent, David P., 4,518,300, Cl. 414-46.000.

Conway, Malcolm J. Method and apparatus for effecting and evaluating action upon visual imaging. 4,518,361, Cl. 434-307.000.

Cook, William A.; Hoffman, Gary R.; and Pulford, William M., to Du Pont de Nemours, E. I., and Company. Capacitively coupled machine tool safety having a self-test network. 4,518,958, Cl. 340-679.000.

Coombs, Daniel M.: *See*—
Mann, David P.; Kukes, Simon G.; and Coombs, Daniel M., 4,518,484, Cl. 208-87.000.

Coons, Terry L., to Tech Development Inc. Apparatus for preventing overspeed of a turbine drive means. 4,518,310, Cl. 415-36.000.

Cooper, Robin D. G., to Eli Lilly and Company. Allylic chlorination process and compounds prepared thereby. 4,518,531, Cl. 260-245.400.

Copas, Gordon A.; Wilke, Howard C.; and Dykema, Dennis A., to APV Anderson Bros. Inc. Machine for filling containers. 4,518,021, Cl. 141-172.000.

Copeland Corporation: *See*—
Elson, John P.; Muir, Earl B.; and Riffe, Delmar R., 4,518,323, Cl. 417-312.000.

Corabelment A.G.: *See*—
Rumble, Clive S., 4,518,212, Cl. 339-31.00R.

Corazzari, Canzio: *See*—
Govoni, Gabriele; Corazzari, Canzio; Di Stefano, Giovanni; and Loconsolo, Mauro, 4,518,750, Cl. 526-68.000.

Cordis Corporation: *See*—
Pecenka, Frank, 4,517,979, Cl. 128-325.000.

Corey, Victor B.: *See*—
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., 4,517,841, Cl. 73-517.0AV.

Corl, Paul D.: *See*—
Teslawski, Georg; and Corl, Paul D., 4,517,985, Cl. 128-660.000.

Corning Glass Works: *See*—
Borrelli, Nicholas F.; and Trotter, Donald M., 4,518,222, Cl. 350-167.000.

Corrigan, John J., III. Electrical connector and receptacle. 4,518,217, Cl. 339-183.000.

Cote , Gerard G. M.; and Zuber, Bretislav P., to Northern Telecom Limited. Coilers. 4,518,129, Cl. 242-78.000.

Cousin, Maurice; Pipon, Yves; Droulon, Georges; and Lebrun, Jean, to A & M Cousin Etablissements Cousin Freres S.a.r.l. Electric safety lock more specially for motor vehicle doors. 4,518,182, Cl. 292-201.000.

Cox, Michael; Gray, Michael J.; and Duke, Phillip W., to National Research Development Corporation. Winning metal from ore. 4,518,420, Cl. 75-26.000.

CQR Security Systems Limited: *See*—
Solomon, Dennis R., 4,518,946, Cl. 340-326.000.

Crivello, James V., to General Electric Company. Aromatic polyvinyl ethers and heat curable molding compositions obtained therefrom. 4,518,788, Cl. 560-064.000.

Crockett & Kelly, Inc.: *See*—
Horst, Paul V., Sr.; and Hoyt, Charles D., 4,518,847, Cl. 219-365.000.

Crorey, David J.: *See*—
Blatt, Leland F.; and Crorey, David J., 4,518,187, Cl. 294-88.000.

Crosby, Jeffrey N.: *See*—
Mason, John J.; Cunningham, Michael T.; and Crosby, Jeffrey N., 4,518,467, Cl. 204-37.100.

Croskell, Henry; and Graham, Tommy E., to Monsanto Company. Process for recovering gases from landfills. 4,518,399, Cl. 55-16.000.

Crozier, George W.; and McDevitt, Bernard J., to Sperry Corporation. Printer with positional tabbing. 4,519,047, Cl. 364-900.000.

Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Methylene phosphonic acid scale inhibitor compositions derived from aminohydrocarcarbylpiperazine urea adducts. 4,518,777, Cl. 544-337.000.

CSM Suiker B.V.: *See*—
van der Poel, Pieter W., 4,518,436, Cl. 127-60.000.

Cuff, George W.; and McGinity, James W., to Board of Regents, The University of Texas System. Microencapsulation process. 4,518,547, Cl. 264-4.700.

Cummings, Dennis: *See*—
Liebig, William J.; and Cummings, Dennis, 4,517,687, Cl. 3-1.400.

Cundall, Robert L.; and Walker, Derek, to Bristol-Myers Company. "3-Carbamoyloxy cephalosporins". 4,518,773, Cl. 544-16.000.

Cunningham, Michael T.: *See*—
Mason, John J.; Cunningham, Michael T.; and Crosby, Jeffrey N., 4,518,467, Cl. 204-37.100.

Cusano, Dominic A.; Greskovich, Charles D.; and DiBianca, Frank A., to General Electric Company. Method for sintering high density yttria-gadolinia ceramic scintillators. 4,518,545, Cl. 264-1.200.

Cusano, Dominic A.: *See*—
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,518,546, Cl. 264-1.200.

Cuscurida, Michael; Waddill, Harold G.; and Peterson, Bruce W., to Texaco Inc. Flexible polyurethane foams made from polyether polyols modified with epoxy resin-diamine adducts. 4,518,720, Cl. 521-156.000.

Cuscurida, Michael, to Texaco Inc. Polymer polyols from alkylene oxide adducts of alkanolamines. 4,518,778, Cl. 544-398.000.

Custom Packaging Systems, Inc.: *See*—
LaFleur, Arthur E., 4,518,106, Cl. 222-460.000.

Cybersonic Corporation: *See*—
Vogelsberg, Walter, 4,519,027, Cl. 364-185.000.

Czebe, Laszlo : *See*—
Takacs, Istvan; Kerey, Gyorgy; Illes, Janos; Rudolf, Peter; Gere, Pal; Czebe, Laszlo ; and Neszmelyi, Erzsebet, 4,518,771, Cl. 536-21.000.

Czulak, Joseph, to Institut National de la Recherche Agronomique. Process for recovering the whey proteins, the application thereof to cheese-making and the resulting cheeses. 4,518,616, Cl. 426-40.000.

Dacomed Corporation: *See*—
Timm, Gerald W.; Sandford, Donald L.; and Claude, Timothy J., 4,517,967, Cl. 128-79.000.

Daewoo Heavy Industries Ltd.: *See*—
Park, Kwang S., 4,517,908, Cl. 112-129.000.

Dagenais, Dominique M., to Avco Everett Research Laboratory, Inc. Method and apparatus for optical beam shaping. 4,518,232, Cl. 350-620.000.

DAGMA Deutsche Automaten-und Getrankemaschinen GmbH & Co., Ltd.: *See*—
Kuckens, Alexander; and Kohl, Horst, 4,518,105, Cl. 222-207.000.

Dahneke, Barton E.; and Marchant, Alan B., to Eastman Kodak Company. Sealed optical disk unit, apparatus and method for debris-suppressed recording. 4,519,061, Cl. 369-109.000.

Daimler-Benz AG: *See*—
Forster, Alfred; Geyer, Willi; and Kober, Leo, 4,518,196, Cl. 296-204.000.

Daimler-Benz Aktiengesellschaft: *See*—
Gallitzendorfer, Joseph; Pfeiffer, Peter; Tomforde, Johann; Parisch, Jochen; and Zweigart, Gerhard, 4,518,197, Cl. 296-213.000.
Merkle, Josef, 4,518,154, Cl. 267-34.000.
Scheurenbrand, Dieter; Stotz, Manfred; Distel, Manfred; and Kleinschmit, Einhard, 4,518,091, Cl. 220-5.00A.

Dalziel, John: *See*—
Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, 4,518,415, Cl. 71-92.000.

Dambenieks, Andrejs: *See*—
Lenserts, George V.; Charchanko, Eugene W.; and Dambenieks, Andrejs, 4,517,739, Cl. 29-846.000.

Damco Testers, Inc.: *See*—
Miller, Darwin L.; and Miller, Ronnie F., 4,517,828, Cl. 73-46.000.

Dameron, James L., Jr. Picture locating tool. 4,517,860, Cl. 81-487.000.

Dana Corporation: *See*—
Belter, Jerome G., 4,518,168, Cl. 277-235.00B.
Hennon, Erin D.; and Joyner, Robert G., 4,518,017, Cl. 138-96.00R.

Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., to United States of America, Navy. Test device for expendable bathythermograph set (XBT). 4,518,915, Cl. 324-158.00R.

Danfoss A/S: *See*—
Andresen, Erik E.; and Pedersen, Svend P., 4,518,147, Cl. 251-121.000.

Daniel, Maurice. Light emitting optical fiber assemblies and method for forming the same. 4,519,017, Cl. 362-32.000.

Daniels, Jean G., to Monahan, William Jay, a part interest. Lawn furniture covering. 4,518,198, Cl. 297-229.000.

Daniels, Phillip D. Method of making multi-section decorative panel. 4,518,447, Cl. 156-71.000.

Danielson, Robert L.: *See*—
Wilson, Mildred N.; Danielson, Robert L.; Bosco, Peter M.; and Steensen, Wayne L., 4,518,622, Cl. 426-578.000.

Dannelly, Clarence C.: *See*—
Wu, Stephen H.; and Dannelly, Clarence C., 4,518,769, Cl. 528-486.000.

Dargel, Robert L. Reuseable air filter system. 4,518,402, Cl. 55-103.000.

Das, Balbhadra: *See*—
McWilliams, Donald E.; Melle, Carl A.; and Das, Balbhadra, 4,518,653, Cl. 428-378.000.

Data Card Corporation: *See*—
Gabel, Edward R.; Puumala, Edward J.; and LeVasseur, Rodney J., 4,518,853, Cl. 235-449.000.

Data General Corporation: *See*—
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.

Daum, Werner: *See*—
Brandes, Wilhelm; and Daum, Werner, 4,518,605, Cl. 514-383.000.

Davies, Michael L.: *See*—
Buckner, Arthur B.; Davies, Michael L.; and Weber, Lawrence W., 4,517,880, Cl. 98-1.000.

Davis, Burns: *See*—
Barbee, Robert B.; and Davis, Burns, 4,518,763, Cl. 528-173.000.

Davis, Dale M.; and Robbins, John C. Highly accurate projectile for use with small arms. 4,517,898, Cl. 102-514.000.

Davis, James R.; and Hoffend, John C. Modular screen printing apparatus. 4,517,894, Cl. 101-126.000.

Davis, James W.; and Jones, Frank D., to International Business Machines Corporation. Cascoded PLA array. 4,518,874, Cl. 307-467.000.

Davis, Walter L.; and Raghunathan, Kuppuswamy, to Motorola, Inc. Universal paging device with power conservation. 4,518,961, Cl. 340-825.440.

Dawley, Dale K. Swimmer's lap pacer. 4,518,266, Cl. 368-10.000.

Dawson, Marcia I.; and Chan, Rebecca L. S., to SRI International. Naphtenic and heterocyclic retinoic acid analogues. 4,518,609, Cl. 514-448.000.

de la Cruz Toran, D. Mariano. Air cushion vehicle provided with a lift system with automatic transversal air distribution. 4,518,054, Cl. 180-118.000.

Deakins, Thomas A. Hubless pipe coupling. 4,518,177, Cl. 285-64.000.

Deal, Troy M. Cutterhead attachment for a dredge. 4,517,754, Cl. 37-66.000.

de Bentzmann, Bertrand L. Device for producing reinforcements for use in reinforced concrete. 4,518,841, Cl. 219-56.000.

Dedolph, Richard R., to Gravi-Mechanics. Chain of soil plugs and a process for producing a chain of soil plugs. 4,517,764, Cl. 47-77.000.

Deere & Company: *See*—
Denning, Barry K.; and Ziegler, Duane H., 4,517,792, Cl. 56-10.200.
Goodell, Bradley D., 4,518,320, Cl. 417-217.000.
Lane, Lloyd L.; and Hosford, Gregory S., 4,517,855, Cl. 74-528.000.
Meiers, Gerald F., 4,517,795, Cl. 56-341.000.
Nelson, Roger J., 4,518,045, Cl. 172-7.000.
Rettig, Vernon E.; Bigbee, Marvin L.; Steilen, Ronald M.; and Head, Glenn D., Jr., 4,518,046, Cl. 172-311.000.
Ring, Curtis P., 4,518,319, Cl. 417-217.000.
Roth, Wolfgang, 4,518,373, Cl. 474-109.000.
Schafer, Helmut; Huckler, Volker; and Teich, Michael, 4,517,856, Cl. 74-528.000.
Stuhrmann, Heinz, 4,518,305, Cl. 414-719.000.
Tindall, Gary W.; Lysenko, George P.; Vize, Richard J.; Kiefer, Edward H.; and Smith, Richard J., 4,518,195, Cl. 296-148.000.
Wiegardt, Gordon K.; Hanks, Thomas W.; and Kittle, Carl E., 4,518,044, Cl. 172-7.000.

Deflecta-Shield Corporation: *See*—
Williams, Robert D.; and Mastin, James, 4,518,191, Cl. 296-91.000.

Deindoerfer, Fred H., to International Remote Imaging Systems, Inc. Method of determining the diagnostic significance of the content of a volume of biological sample containing particles. 4,519,087, Cl. 377-10.000.

Deiss, Willy-Jean: *See*—
Boutevin, Bernard; Deiss, Willy-Jean; Maliszewicz, Marc; and Pietrasanta, Yves, 4,518,794, Cl. 560-192.000.

Deitz, Victor R. In situ regeneration of the efficiency of activated carbon filters for trapping radioactive iodine. 4,518,562, Cl. 376-313.000.

deKok, Peter T.; and Phildius, John, to Gran-Quartz Trading, Inc. Removable mount for cutting means. 4,517,954, Cl. 125-15.000.

de Larosiere, Pierre J. Multi-unit tear-away container carrier. 4,518,081, Cl. 206-158.000.

Delony, Timothy E.; and Chu, Daniel Y. M., to Bio-Rad Laboratories, Inc. End clamp for gel slab plate assembly. 4,518,476, Cl. 204-299.00R.

Deluxe Innovations, Inc.: *See*—
Petricka, Ronald E., 4,517,699, Cl. 15-104.040.

DeMarco, Joseph M.: *See*—
Fechalos, William A.; and DeMarco, Joseph M., 4,519,072, Cl. 370-110.100.

Denis, Philippe V., to Staar S. A. Cleaning mode for discs or records. 4,519,059, Cl. 369-74.000.

Denning, Barry K.; and Ziegler, Duane H., to Deere & Company. Grain loss monitor sensor mounting arrangement for a combine. 4,517,792, Cl. 56-10.200.

Dennison Manufacturing Company: *See*—
Fotland, Richard A.; and Beaudet, Leo A., 4,518,468, Cl. 204-38.300.

Dentsply Research & Development Corp.: *See*—
Green, Russell D., 4,518,356, Cl. 433-102.000.

Deraedt, Roger: *See*—
Allais, Andre ; Clemence, Francois; Deraedt, Roger; and Lemartret, Odile, 4,518,775, Cl. 544-92.000.

Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, to Klein, Schanzlin & Becker Aktiengesellschaft. Centrifugal pump. 4,518,311, Cl. 415-102.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys; Shah, Raj; Lewarchik, Ronald J.; and Murray, Kevin P., 4,518,746, Cl. 525-443.000.

Devico, Michael J.; and Hillman, Gary, to Machine Technology, Inc. Splash retarder. 4,517,752, Cl. 34-58.000.

Dewilde, Francois: *See*—
Rouy, Noel; and Dewilde, Francois, 4,518,781, Cl. 548-221.000.

Dewson, Frederick J. Mine ventilation door. 4,517,767, Cl. 49-464.000.

Dexter, Robin W.: *See*—
Kaufman, Ernest D.; and Dexter, Robin W., 4,518,511, Cl. 252-8.55B.

Dhabhar, Dadi J.; and Schmidt, Nicholas F., to Richardson-Vicks Inc. Hydrophilic denture adhesive. 4,518,721, Cl. 523-120.000.

Diasonics, Inc.: *See*—
Teslawski, Georg; and Corl, Paul D., 4,517,985, Cl. 128-660.000.

Diaz, Zaida, to Shell Oil Company. H_2S Removal from gas streams. 4,518,576, Cl. 423-573.00R.

DiBianca, Frank A.: *See*—
Cusano, Dominic A.; Greskovich, Charles D.; and DiBianca, Frank A., 4,518,545, Cl. 264-1.200.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,518,546, Cl. 264-1.200.

Dickakian, Ghazi, to Du Pont de Nemours, E. I., and Company. Pitch for direct spinning into carbon fibers derived from a coal distillate feedstock. 4,518,482, Cl. 208-22.000.
Dickakian, Ghazi, to Du Pont de Nemours, E. I., and Company. Aromatic pitch from asphaltene fractions. 4,518,483, Cl. 208-44.000.
Dielhof, Pieter B., to U.S. Philips Corporation. Preamplifier. 4,518,923, Cl. 330-9.000.
Diepeveen, Neal, to Magnavox Government and Industrial Electronics Co. Stepped polygon scan mirror. 4,518,218, Cl. 350-6.800.
Diesel Kiki Co., Ltd.: *See*—
Hirano, Yutaka, 4,517,831, Cl. 73-116.000.
DiFonzo, Anthony E.: *See*—
Swis, Philip E.; and DiFonzo, Anthony E., 4,518,268, Cl. 374-144.000.
Diggle, Edmund A., Jr.; and Cecere, Andrew P., to Samcoe Holding Corporation. Method for automatically detecting and orienting the edge of a tubular knitted fabric. 4,517,712, Cl. 26-51.400.
Digital Equipment Corporation: *See*—
Olsen, Richard E.; and Baker, Dwight C., 4,519,028, Cl. 364-200.000.
Dill, M. Reese, Jr. Article separator for materials handling. 4,518,151, Cl. 254-93.0HP.
Director-General of the Agency of Industrial Science and Technology: *See*—
Yoshida, Hisayoshi; Ogawa, Ichitaro; Hagio, Tsuyoshi; Kobayashi, Kazuo; and Yamamoto, Takayoshi, 4,518,702, Cl. 501-90.000.
Discovision Associates: *See*—
Wilkinson, Richard L.; and Giddings, Gary M., 4,519,004, Cl. 358-342.000.
Di Stefano, Giovanni: *See*—
Govoni, Gabriele; Corazzari, Canzio; Di Stefano, Giovanni; and Loconsolo, Mauro, 4,518,750, Cl. 526-68.000.
Distel, Manfred: *See*—
Scheurenbrand, Dieter; Stotz, Manfred; Distel, Manfred; and Kleinschmit, Einhard, 4,518,091, Cl. 220-5.00A.
Disteldorf, Josef; and Flakus, Werner, to Chemische Werke Huls Aktiengesellshcaft. Moisture-hardening varnishes with an isocyanate resin base. 4,518,740, Cl. 524-783.000.
Ditter, Stephen D.: *See*—
Pirkey, Robert J.; and Ditter, Stephen D., 4,517,942, Cl. 123-376.000.
Dituri, Angelo: *See*—
LiDonnici, Kenneth; and Dituri, Angelo, 4,518,233, Cl. 353-87.000.
Dr. Johannes Heidenhain GmbH: *See*—
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Dr. Karl Thomae GmbH: *See*—
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,518,596, Cl. 514-232.000.
Dohi, Takashi: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,517,909, Cl. 112-275.000.
Donaldson, Charles W., to General Electric Company. Optical inspection system and method. 4,518,257, Cl. 356-375.000.
Dontscheff, Helmut, to Boeing Company, The. Controlled depth cutting method and apparatus. 4,517,872, Cl. 85-880.000.
Doppelfeld, Ille-Stephanie: *See*—
Biedermann, Jurgen; Prop, Gerrit; and Doppelfeld, Ille-Stephanie, 4,518,783, Cl. 548-353.000.
Dor Seal Limited: *See*—
Drennan, Frank E., 4,518,446, Cl. 156-63.000.
Dorn, Alfred, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. System for detecting the position of a sheet on its support. 4,518,862, Cl. 250-561.000.
Dorn, Peter: *See*—
Sung, Rodney L.; Kaufman, Benjamin J.; and Dorn, Peter, 4,518,782, Cl. 548-353.000.
Dorre, Erhard: *See*—
Brinkmann, Egon; Putenat, Mandred; and Dorre, Erhard, 4,518,357, Cl. 433-173.000.
Dorsch, Dieter, to Grittmann, Gunter. Device for the dosed diffusion of gases in liquids. 4,518,543, Cl. 261-64.00B.
Dorst Maschinen-und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel & Co.: *See*—
Suffa, Hilmar, 4,518,341, Cl. 425-405.00H.
Dossekker, Bruno, to Sodecom SA. Reed mouthpiece for musical wind instrument. 4,517,875, Cl. 84-383.00R.
Dover Corporation: *See*—
Greenburg, Jimmy L., 4,518,150, Cl. 251-306.000.
Dow Chemical Company, The: *See*—
Barker, Michael, 4,517,776, Cl. 52-90.000.
Crump, Druce K.; and Wilson, David A., 4,518,777, Cl. 544-337.000.
Johnson, Oscar; and Luecke, Robert A., 4,518,681, Cl. 430-532.000.
Rigterink, Raymond H.; and Bisabri-Ershadi, Barat, 4,518,804, Cl. 564-442.000.
Wolcott, Richard A., 4,518,504, Cl. 210-670.000.
Dow Corning Corporation: *See*—
Antonen, Robert C., 4,518,631, Cl. 427-96.000.
Lee, Chi-Long; and Rabe, James A., 4,518,716, Cl. 521-82.000.
Dow Corning Limited: *See*—
Treadgold, Richard C., 4,518,787, Cl. 556-442.000.
Dowty Hydraulic Units Limited: *See*—
Parker, Dennis W., 4,518,937, Cl. 335-229.000.
Doyle, Richard C.; and Rivera, Lester, to Leviton Manufacturing Company, Inc. Remote control system. 4,518,945, Cl. 340-310.00A.
Drabek, Jozef: *See*—
Kristiansen, Odd; and Drabek, Jozef, 4,518,601, Cl. 514-340.000.
Drackett Company, The: *See*—
Shaer, Elias H., 4,518,694, Cl. 435-188.000.
Drake, Cyril F.; Maries, Alan; and Bateson, Paul F., to ITT Industries, Inc. Corrosion inhibiting paint composition. 4,518,429, Cl. 106-14.390.
Draney, Daniel R.: *See*—
Wang, David W.; and Draney, Daniel R., 4,518,786, Cl. 549-552.000.
Drennan, Frank E., to Dor Seal Limited. Method of making bevelled glass window. 4,518,446, Cl. 156-63.000.
Dresser Industries, Inc.: *See*—
Kerzner, Mark G., 4,517,835, Cl. 73-152.000.
Drew, Louis E.: *See*—
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.
Drexler, Leonard H.; Flynn, Richard M.; Fox, George R.; Illium, Herbert C., Jr.; and O'Connor, Robert J., to AT&T Bell Laboratories. Armored telephone cord with a longitudinal strength member. 4,518,830, Cl. 179-103.000.
Droulon, Georges: *See*—
Cousin, Maurice; Pipon, Yves; Droulon, Georges; and Lebrun, Jean, 4,518,182, Cl. 292-201.000.
Druke, Michael B.: *See*—
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.
Du Pont Canada Inc.: *See*—
Fletcher, Eldon L., 4,518,280, Cl. 405-17.000.
Du Bois, Jerry M.; and Spanjer, Keith G., to Motorola, Inc. High current package with multi-level leads. 4,518,982, Cl. 357-74.000.
Ducarre, Alphonse: *See*—
Guittard, Pierre; Jarry, Philippe; Ducarre, Alphonse; and Haji, Lazhar, 4,518,980, Cl. 357-30.000.
Dudding, Frank. Wet blasting apparatus. 4,517,774, Cl. 51-436.000.
Duerig, Thomas: *See*—
Albrecht, Joachim; and Duerig, Thomas, 4,518,444, Cl. 148-402.000.
Duhon, Dane J. Cymbal support. 4,517,876, Cl. 84-422.00R.
Duke, Phillip W.: *See*—
Cox, Michael; Gray, Michael J.; and Duke, Phillip W., 4,518,420, Cl. 75-26.000.
Dumke, William P.; and Woodall, Jerry M. P., to International Business Machines Corporation. Semiconductor transistor with graded base and collector. 4,518,979, Cl. 557-30.000.
Dunn, George T.: *See*—
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,518,018, Cl. 138-130.000.
Dunsworth, Charles L., to Metalines, Inc. Fire resistant expansion joint cover. 4,517,779, Cl. 52-232.000.
Du Pont de Nemours, E. I., and Company: *See*—
Cook, William A.; Hoffman, Gary R.; and Pulford, William M., 4,518,958, Cl. 340-679.000.
Dickakian, Ghazi, 4,518,482, Cl. 208-22.000.
Dickakian, Ghazi, 4,518,483, Cl. 208-44.000.
Gessell, Donald E., 4,518,706, Cl. 502-104.000.
Grot, Walther G.; Rivera, Joseph T.; and Silva, Raimund H., 4,518,650, Cl. 428-286.000.
Heiart, Robert B.; and Cohen, Abraham B., 4,518,667, Cl. 430-22.000.
Hill, Broadus E., Jr., 4,518,133, Cl. 242-165.000.
Phillips, William L., Jr., 4,518,440, Cl. 148-6.14R.
Quinn, John A.; and O'Neil, James W., 4,518,666, Cl. 430-7.000.
Rucker, Klaus G., 4,517,895, Cl. 102-202.200.
Seiffert, Edward J., 4,518,343, Cl. 425-466.000.
Wolfe, William R., Jr., 4,518,651, Cl. 428-308.800.
Dupro AG: *See*—
Hug, Nikolaus, 4,517,705, Cl. 15-351.000.
Dureux, Pierre J. C., to U.S. Philips Corporation. Apparatus for storing and processing analogue signals to be displayed as an oscilloscopic image and oscilloscope comprising such apparatus. 4,518,991, Cl. 358-93.000.
Dussy, Paul: *See*—
Mollet, Hans; and Dussy, Paul, 4,518,392, Cl. 8-609.000.
Dutko, Wolodymyr, to A. B. Dick Company. Sealing means. 4,518,167, Cl. 277-81.00R.
Duval Corporation: *See*—
Fletcher, Archibald W.; and Hunt, Charles d'A., 4,518,418, Cl. 75-10.00R.
Duvier, Henry A., Jr. Light weight insulating building blocks and method of making same. 4,518,431, Cl. 106-97.000.
Duwel, Edward C.: *See*—
Abellana, Jovito N.; and Duwel, Edward C., 4,519,048, Cl. 364-900.000.
Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., to Allied Corporation. Method for grounding and terminating a cable. 4,517,740, Cl. 29-857.000.
Dye, Donald D. Idler pulley and method of mounting a precision bearing. 4,518,372, Cl. 474-94.000.

Dykema, Dennis A.: *See—*
Copas, Gordon A.; Wilke, Howard C.; and Dykema, Dennis A., 4,518,021, Cl. 141-172.000.

Dynamics Corporation of America: *See—*
Brym, Stanley J.; and Valbona, Bruno M., 4,518,263, Cl. 366-206.000.

E. Beaudrey & Cie: *See—*
Jackson, Philip, 4,518,494, Cl. 210-158.000.

E. Blum GmbH & Co.: *See—*
Geschka, Hugo-Werner, 4,518,942, Cl. 336-178.000.

E.C.H. Will (GmbH & Co.): *See—*
Aykut, Kurt; and Reissmann, Klaus, 4,518,075, Cl. 198-460.000.

E. R. Squibb & Sons: *See—*
Jensen, Ole R., 4,518,388, Cl. 604-332.000.

E-Systems, Inc.: *See—*
Poston, Billy R.; and Andren, Carl F., 4,518,947, Cl. 340-347.0DD.

Easley, Thomas E. Method and apparatus for decoding wafer combination locks. 4,517,746, Cl. 33-549.000.

Eastman Kodak Company: *See—*
Barbee, Robert B.; and Davis, Burns, 4,518,763, Cl. 528-173.000.
Dahneke, Barton E.; and Marchant, Alan B., 4,519,061, Cl. 369-109.000.
Gustafson, Bruce L., 4,518,714, Cl. 518-721.000.
Rubin, Jacob D., 4,517,734, Cl. 29-577.0OC.
Spitzner, Jerome G.; and Stoudt, Michael D., 4,518,246, Cl. 355-4.000.
Wang, Richard H. S.; and Myers, Garry L., 4,518,808, Cl. 568-765.000.
Ward, John W., 4,518,259, Cl. 356-446.000.
Wu, Stephen H.; and Dannelly, Clarence C., 4,518,769, Cl. 528-486.000.

Ebato, Noboru: *See—*
Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, 4,518,665, Cl. 429-153.000.

Ebel, Mark S.: *See—*
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Eberhart, Gerald E.; and Sauls, Goah T., to Olin Corporation. Primer pocketing method for brass cartridge cases. 4,517,716, Cl. 29-1.300.

Ebisu, Tomio: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Komura, Akio; and Ebisu, Tomio, 4,518,556, Cl. 264-295.000.

Eby, Randall W.: *See—*
Lamp'l, Thomas A.; and Eby, Randall W., 4,517,698, Cl. 14-72.500.

Eckels, Phillip W., to Electric Power Research Institute, Inc. Superconducting rotor with vapor cooled cryogenic leads having a regenerator portion. 4,518,885, Cl. 310-52.000.

Eckhardt, Heinz; Halbritter, Klaus; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Malondialdehyde tetraalkylacetals and their preparation. 4,518,785, Cl. 549-453.000.

Economics Laboratory, Inc.: *See—*
Freis, Richard E.; Maloney, James E.; and Oakes, Thomas R., 4,518,459, Cl. 162-5.000.

Economy Engineering, Inc.: *See—*
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,518,061, Cl. 187-18.000.

Ederer Incorporated: *See—*
West, Harold H.; Johnson, Roger A.; and Clark, Charles W., Jr., 4,518,153, Cl. 254-274.000.

Edwards, John V.: *See—*
Steer, Peter L.; and Edwards, John V., 4,518,389, Cl. 604-339.000.

Ege, Sigmund: *See—*
Pedersen, Jack R.; and Ege, Sigmund, 4,518,445, Cl. 156-49.000.

Eggebrecht, John L.; Rogers, Harold D.; and Yorozu, Arthur S., to Boeing Company, The. Air conditioning system and air mixing/water separation apparatus therein. 4,517,813, Cl. 62-284.000.

Ehrlich, Conrad P.; and Ehrlich, Sandra L. Stove safety guard. 4,517,955, Cl. 126-2'1.000.

Ehrlich, Sandra L.: *See—*
Ehrlich, Conrad P.; and Ehrlich, Sandra L., 4,517,955, Cl. 126-211.000.

Eichbauer, George N.; and LeBlanc, Beth A., to Mobil Oil Corporation. One-sided cling stretch wrap. 4,518,654, Cl. 428-331.000.

Eigen, Edward; Twersky, David Z.; and Brachman, Dina I., to Colgate-Palmolive Company. Non-antimicrobial deodorant cleansing composition. 4,518,517, Cl. 252-107.000.

Eldridge, Charles W., to Herrin, Melvin B. Apparatus and method for joining individual blanks. 4,518,379, Cl. 493-334.000.

Electric Power Research Institute, Inc.: *See—*
Eckels, Phillip W., 4,518,885, Cl. 310-52.000.
Park, Dong-Sil; and Zabala, Robert J., 4,518,624, Cl. 427-34.000.

Elevator GmbH: *See—*
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Eli Lilly and Company: *See—*
Cooper, Robin D. G., 4,518,531, Cl. 260-245.400.

Elias, Charles R. Adjustable speed drive utilizing radially movable hollow pistons which act on a cam surface. 4,518,069, Cl. 192-60.000.

Elkhart Machine & Tool Co., Inc.: *See—*
Barfell, Don L., 4,518,139, Cl. 248-418.000.

Ellenbaum, Frank H.; and Ciesco, Richard, to International Minerals & Chemical Corp. Agglomerates containing olivine. 4,518,428, Cl. 75-257.000.

Elliott, Donald C.: *See—*
Breeze, Gerald D.; and Elliott, Donald C., 4,519,013, Cl. 361-384.000.

Elliott, Richard J., to Charlton Associates. Rigid computer memory disc manufacturing method. 4,517,772, Cl. 51-281.0SF.

Ellison, Arthur E. Tissue retractor. 4,517,965, Cl. 128-20.000.

Ellman, Alan G.: *See—*
Garito, Jon C.; and Ellman, Alan G., 4,517,975, Cl. 128-303.130.

El-Nashar, Ibrahim: *See—*
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Elopak Limited: *See—*
Skinner, Edward A., 4,518,377, Cl. 493-58.000.

Elsaesser, Dieter; von der Heide, Johann; Muller, Rolf; and Papst, Georg, to Papst-Motoren GmbH & Co. KG. Driving mechanism for magnetic hard disc memories. 4,519,010, Cl. 360-97.000.

Elson, John P.; Muir, Earl B.; and Riffe, Delmar R., to Copeland Corporation. Hermetic refrigeration compressor. 4,518,323, Cl. 417-312.000.

Eltac Nogler & Daum KG: *See—*
Oppitz, Hans, 4,518,851, Cl. 219-549.000.

Eltech Systems Corporation: *See—*
Solomon, Frank; and Grun, Charles, 4,518,705, Cl. 502-101.000.

ELXSI: *See—*
Smith, Gehrard J.; and Holly, Kenneth, 4,519,034, Cl. 364-200.000.

Emerson Electric Co.: *See—*
Mueller, Carl J.; and Haefner, John S., 4,518,345, Cl. 431-24.000.

Emhart Industries, Inc.: *See—*
Braithwaite, David, 4,518,412, Cl. 65-244.000.

EMI Limited: *See—*
Green, Ian M., 4,519,036, Cl. 364-200.000.

Emkay Manufacturing Co.: *See—*
Kaplan, Alan, 4,517,918, Cl. 118-723.000.

Emonts, Johannes, to Bayerische Motoren Werke AG. Supercharging pressure control device for turbocharged internal combustion engines. 4,517,801, Cl. 60-602.000.

Empire Abrasive Equipment Corporation: *See—*
Keltz, Douglas; and Heaton, Robert, 4,518,145, Cl. 251-5.000.

Endelson, Robert A., to Microtech Associates. Flat cigarette lighter. 4,517,994, Cl. 131-329.000.

Endo, Takafumi, to Mitsubishi Denki Kabushiki Kaisha. Thermal head. 4,518,971, Cl. 346-76.0PH.

Enercorp Management, Ltd.: *See—*
Cole, Charles; and Cole, Wayne, 4,517,826, Cl. 73-40.000.

Energy Development Associates, Inc.: *See—*
Kodali, Satyanarayana; Singh, Bhim S.; Whittlesey, Curtis C.; and Henriksen, Gary L., 4,518,663, Cl. 429-18.000.
Whittlesey, Curtis C.; Henriksen, Gary L.; Keryluk, Walter B.; and Wolff, Merle T., 4,518,664, Cl. 429-38.000.

Engel, Thomas H. Telescoping support apparatus for containers. 4,517,775, Cl. 52-40.000.

Engelhardt, Friedrich; and Greiner, Ulrich, to Cassella Aktiengesellschaft. Metal chelates of water soluble copolymers. 4,518,745, Cl. 525-326.600.

English Electric Valve Company, Ltd.: *See—*
Pickering, Alan H., 4,518,932, Cl. 331-90.000.

Engwert, Gerald H., to Fresh Tech, Inc. Door assembly. 4,518,095, Cl. 220-260.000.

Enichimica Secondaria, S.p.A.: *See—*
Greco, Alberto; and Bertolini, Guglielmo, 4,518,766, Cl. 528-370.000.

Eoga, Anthony B. J., to Warner-Lambert Company. Cleaner having improved dissolution time and clarity and improved of preparation. 4,518,520, Cl. 252-174.230.

Epson Corporation: *See—*
Akazawa, Hiroyuki, 4,518,269, Cl. 400-124.000.

Erickson, Lawrence R.: *See—*
Beversdorf, Wallace D.; Erickson, Lawrence R.; and Grant, Ian, 4,517,763, Cl. 47-58.000.

Ernest, Ivan: *See—*
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,518,533, Cl. 260-245.400.

Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Apparatus and method for correcting errors in a length or angle measuring system. 4,517,742, Cl. 33-125.00C.

Ernst, Hansgeorg; Vogel, Friedrich; and Paust, Joachim, to BASF Aktiengesellschaft. Optically active units for the synthesis of the side chain of (R,R,R)-α-tocopherol and their preparation. 4,518,813, Cl. 570-241.000.

Essilor International Cie Generale d'Optique: *See—*
Tagnon, Luc, 4,517,980, Cl. 128-395.000.

Etablissements Caillau: *See—*
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Ethyl Corporation: *See—*
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Etienne LaCroix - Tous Artifices: *See—*
Billard, Alain A.; and Santalucia, Andre R., 4,517,896, Cl. 102-342.000.

Eue, Ludwig: *See—*
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Evans, John M. Instrument and method for epidural and spinal anaesthesia. 4,518,383, Cl. 604-51.000.

Evers, Walter: *See—*
Hoffmann, Peter; and Evers, Walter, 4,518,006, Cl. 137-218.000.

Explosive Fabricators, Inc.: *See—*
Hardwick, Roy, 4,518,111, Cl. 228-107.000.

Exxon Production Research Co.: *See—*
Lim, Git B.; and Konak, A. Riza, 4,518,505, Cl. 210-712.000.

Exxon Research & Engineering Co.: *See—*
Johnson, Jack W.; and Jacobson, Allan J., 4,518,534, Cl. 260-429.00R.
Kramer, George M.; Weissman, Walter; Brown, Herbert C.; and Pettit, Rowland, deceased, 4,518,798, Cl. 560-233.000.
Marin, Pierre D., 4,518,481, Cl. 208-19.000.
Osman, Robert M.; and Shulik, Larry J., 4,518,574, Cl. 423-360.000.
Schulz, Donald N.; Kitano, Kissho; Burkhardt, Terry J.; and Langer, Arthur W., 4,518,757, Cl. 526-329.000.
Soled, Stuart L.; and Fiato, Rocco A., 4,518,707, Cl. 502-174.000.

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Faessel, Andre ; Mennel, Gabriel B.; and Michaux, Jacques M., to Sacilor. Shaped blanks, methods for their production and improvements to the universal rolling of rails. 4,518,660, Cl. 428-577.000.

Fairchild Camera & Instrument Corporation: *See—*
Khan, Mahboob; and Trieu, Tom, 4,517,731, Cl. 29-571.000.

Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., to Honeywell Inc. Real time automated inspection. 4,519,041, Cl. 364-552.000.

Fanuc Ltd.: *See—*
Obara, Haruki, 4,518,842, Cl. 219-69.00W.

Fareri, Elizabeth L.: *See—*
Templin, Philip R.; and Fareri, Elizabeth L., 4,518,394, Cl. 44-38.000.

Faris, Alan E., to TRW Inc. Temperature stabilizer. 4,518,944, Cl. 338-22.00R.

Faschingleitner, Leopold: *See—*
Krempl, Peter W.; Schindler, Wolfgang; and Faschingleitner, Leopold, 4,518,861, Cl. 250-339.000.

Faure, Raymond, to Compagnie Generale des Etablissements Michelin. Apparatus for measuring forces. 4,517,848, Cl. 73-862.520.

Fayette, Brad K., to GTE Communication Systems Corporation. Sense point monitor circuit. 4,519,025, Cl. 364-141.000.

Febopal Limited: *See—*
Levchenko, Alec; and Booth, Michael R., 4,517,883, Cl. 98-115.300.

Fechalos, William A.; and DeMarco, Joseph M., to Rockwell International Corporation. Answer supervision system. 4,519,072, Cl. 370-110.100.

Fecht, Hans-Rudolf: *See—*
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Fecik, Michael T.: *See—*
Frank, Robert G.; Fecik, Michael T.; and Claassen, George R., 4,518,411, Cl. 65-106.000.

Federico, Joseph; and Waaben, Sigurd G., to AT&T Bell Laboratories. Two-terminal transistor rectifier circuit arrangement. 4,519,024, Cl. 363-127.000.

Fedlmuhle Aktiengesellschaft: *See—*
Brinkmann, Egon; Putenat, Mandred; and Dorre, Erhard, 4,518,357, Cl. 433-173.000.

Feisel, Armin; and Wirz, Walter, to Reishauer AG. Workpiece pallet tray with plastic insert holders. 4,518,076, Cl. 198-648.000.

Fender, C. Leo. String lock mechanism for musical instruments. 4,517,874, Cl. 84-314.00N.

Fenner, James A., to Boeing Company, The. Test stop assembly for oxygen box door. 4,518,179, Cl. 292-166.000.

Fenster, Abraham S.; and Buechler, Lawrence W., to Milwaukee Valve Company. Quarter turn valve including supervisory switch assembly. 4,518,008, Cl. 137-552.000.

Fermaglich, Saul, to Intercontinental Water Corp. Water purification method and device. 4,518,503, Cl. 210-662.000.

Ferranto, John J. Drawing board assembly. 4,518,140, Cl. 248-456.000.

Ferrio, Linda J.: *See—*
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., 4,519,045, Cl. 364-709.000.

Fiat Auto S.p.A.: *See—*
Burgio di Aragona, Antonio, 4,517,936, Cl. 123-90.500.

Fiato, Rocco A.: *See—*
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Valdes, Guillermo A.; Pacheco, Benjamin G.; Figueredo, Fernando F.; and Framil, Armando, 4,518,022, Cl. 30-166.00R.

Finamore, Paul V. Hairpiece and method of making same. 4,517,999, Cl. 132-53.000.

Finch, Robert E., Jr. Method and apparatus for applying a therapeutic article to a body. 4,517,972, Cl. 128-156.000.

Fischer, Larry E.; Sridhar, Bettadapur N.; and Bean, Jackie E., to General Electric Company. Control of nuclear reactors. 4,518,559, Cl. 376-230.000.

Fischer, William H., to Presray Corporation, The. Inflatable plug. 4,518,015, Cl. 138-93.000.

Fish, Richard H., to United States of America, Energy. Removal of arsenic compounds from petroliferous liquids. 4,518,490, Cl. 208-251.00R.

Fisher, Robert A.; and Peters, David L., to Singer Company, The. Device to compensate for distortion in target location in a visual system. 4,518,360, Cl. 434-20.000.

Fisons plc: *See—*
Bantick, John R.; Fuher, John; Hardern, David N.; and Lee, Thomas B., 4,518,612, Cl. 514-457.000.

Fister, Louis P.; Pearson, Herby O.; and Fitch, Lawrence H., to Moog Automotive, Inc. Engine torgue resisting strut and vibration damper. 4,518,058, Cl. 180-300.000.

Fitch, Lawrence H.: *See—*
Fister, Louis P.; Pearson, Herby O.; and Fitch, Lawrence H., 4,518,058, Cl. 180-300.000.

Flakus, Werner: *See—*
Disteldorf, Josef; and Flakus, Werner, 4,518,740, Cl. 524-783.000.

Fleischer, Lane G. Combination vending and slot machine. 4,518,098, Cl. 221-13.000.

Fletcher, Archibald W.; and Hunt, Charles d'A., to Duval Corporation. Electron beam refinement of metals, particularly copper. 4,518,418, Cl. 75-10.00R.

Fletcher, Eldon L., to Du Pont Canada Inc. Aquatic weed barrier. 4,518,280, Cl. 405-17.000.

Flowmetering Instruments Limited: *See—*
Harrison, Derek N.; and Purling, Trevor C., 4,517,846, Cl. 73-861.120.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-vinyl and cyclopropyl substituted prostanoic acids and congeners. 4,518,790, Cl. 560-118.000.

Flynn, Richard M.: *See—*
Drexler, Leonard H.; Flynn, Richard M.; Fox, George R.; Illium, Herbert C., Jr.; and O'Connor, Robert J., 4,518,830, Cl. 179-103.000.

FMC Corporation: *See—*
McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 4,518,433, Cl. 106-180.000.

Focke & Co.: *See—*
Focke, Heinz, 4,517,791, Cl. 53-566.000.

Focke, Heinz, to Focke & Co. Apparatus for grouping cigarette cartons and loading containers therewith. 4,517,791, Cl. 53-566.000.

Foley, James; Habbal, Fawwaz; and Leahy, John, to Polaroid Corporation. Apparatus and method for disorienting magnetic particles in magnetic recording media. 4,518,627, Cl. 427-48.000.

Foley, Peter N.; and Turbard, Alan M., to Borg-Warner Limited. Environmental control system. 4,517,810, Cl. 62-186.000.

Folmsbee, Alan C., to Intel Corporation. Radiation shield for an integrated circuit memory with redundant elements. 4,519,050, Cl. 365-53.000.

Forchetti, A. Patrick. Hair implant structure. 4,517,997, Cl. 132-5.000.

Ford Aerospace & Communications Corporation: *See—*
Westerman, Charles W., 4,518,967, Cl. 343-771.000.

Ford Motor Company: *See—*
Beckmann, Norbert, 4,517,710, Cl. 24-453.000.
Holland, Scott B.; Greene, Edward S.; Kowalski, David A.; and Strachan, Bruce D., 4,517,832, Cl. 73-118.000.
Stutenkemper, Paul; Rest, Heinz; and Kloppe, Herbert, 4,518,138, Cl. 248-73.000.

Forrest, Garland F., Jr.: *See—*
Kirkham, Robert L.; and Forrest, Garland F., Jr., 4,518,194, Cl. 296-100.000.

Forster, Alfred; Geyer, Willi; and Kober, Leo, to Daimler-Benz AG. Motor vehicle with integrally formed hydraulic and/or air lines. 4,518,196, Cl. 296-204.000.

Forster, Denis; and Schaefer, George F., to Monsanto Company. Preparation of pentyl nonanols. 4,518,809, Cl. 568-840.000.

Forster, Heinz; Klauke, Erich; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Certain trimethyl silyl-lower-alkyl esters of pyridyloxy-phenoxy-lower alkanoic acids, compositions containing same and herbicidal method of use. 4,518,416, Cl. 71-94.000.

Fory, Werner: *See—*
Meyer, Willy; Fory, Werner; and Topfl, Werner, 4,518,776, Cl. 544-206.000.

Fotland, Richard A.; and Beaudet, Leo A., to Dennison Manufacturing Company. Process for making electrostatic imaging surface. 4,518,468, Cl. 204-38.300.

Foulard, Jean; Rimbert, Jean F.; Vernet, Gilles; and Goursat, Albert-Gilbert, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for producing solid metal particles from a bath of metal. 4,518,421, Cl. 75-49.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; and Nakamura, Naoji, 4,518,439, Cl. 148-3.000.

Fox, George R.: *See—*
Drexler, Leonard H.; Flynn, Richard M.; Fox, George R.; Illium, Herbert C., Jr.; and O'Connor, Robert J., 4,518,830, Cl. 179-103.000.

Foxboro Company, The: *See—*
Miller, Richard W., 4,517,847, Cl. 73-861.740.

Framatome et Cie: *See—*
Hista, Jean C., 4,518,561, Cl. 376-293.000.

Framil, Armando: *See—*
Valdes, Guillermo A.; Pacheco, Benjamin G.; Figueredo, Fernando F.; and Framil, Armando, 4,518,022, Cl. 30-166.00R.

Francis, Michael A., to Ethyl Corporation. Plastic film. 4,518,643, Cl. 428-131.000.

Francois, Fort. Image conductors with a reticulated screen. 4,518,221, Cl. 350-96.260.

Frank, Robert G.; Fecik, Michael T.; and Claassen, George R., to PPG Industries, Inc. Shaping glass sheets to complicated shapes using special lift mold. 4,518,411, Cl. 65-106.000.

Franke, Hans-Joachim: *See—*
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,518,311, Cl. 415-102.000.

Franke, John M., Sr., to Singer Company, The. Driven work folder. 4,517,907, Cl. 112-121.150.

Fratta, Peter J. Cylindrical pin wrench. 4,517,864, Cl. 81-436.000.

Fredrickson, Lee R.; Cascini, Michael R.; and Mosier, Donald E., to Rockwell International Corporation. Multicolored liquid crystal displays utilizing photoluminescent transflectors and mask. 4,518,225, Cl. 350-338.000.

Freeburg, Thomas A.: *See*—
Krebs, Jay; and Freeburg, Thomas A., 4,519,068, Cl. 370-82.000.

Freeouf, John L.; and Jackson, Thomas N., to International Business Machines Corporation. Heater assembly for molecular beam epitaxy furnace. 4,518,846, Cl. 219-271.000.

Freese, Uwe E.: *See*—
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,517,970, Cl. 128-131.000.

Freis, Richard E.; Maloney, James E.; and Oakes, Thomas R., to Economics Laboratory, Inc. Methods of deinking secondary fibers. 4,518,459, Cl. 162-5.000.

French Oil Mill Machinery Co., The: *See*—
Tribbett, Murray C., 4,518,337, Cl. 425-167.000.

Frenco Verzahnungslehren GmbH: *See*—
Och, Rudolf, 4,517,743, Cl. 33-147.00M.

Frentzel, Richard L., to Celotex Corporation, The. Metal catalyzed preparation of polyoxyalkylene surfactants for phenolic foam stabilization. 4,518,719, Cl. 521-136.000.

Fres-co System USA, Inc.: *See*—
Goglio, Luigi, 4,518,087, Cl. 206-632.000.

Fresh Tech, Inc.: *See*—
Engwert, Gerald H., 4,518,095, Cl. 220-260.000.

Frey, Thomas M.; and Kovnat, Larry A., to Xerox Corporation. Magnetographic carriage printer. 4,519,000, Cl. 358-301.000.

Frey-Wigger, Paul. Attachment for the booms of cranes or the like. 4,518,059, Cl. 182-2.000.

Frichmann, Albert; Sternisa, Danilo; Mermi, Kurt; and Kistner, Herbert, to Upat GmbH & Co. Anchoring bolt. 4,518,290, Cl. 411-30.000.

Friedli, Paul; Hinderling, Thomas; and Begle, Guntram, to Inventio AG. Set value transmitter for a drive regulation apparatus. 4,518,909, Cl. 318-566.000.

Friedrich, Douglas S., to Marconi Avionics Limited. Communication system providing amplifier gain by half-cycle carrier signal control. 4,519,067, Cl. 370-78.000.

Frigoscandia Contracting AB: *See*—
Rothstein, Sven O., 4,517,814, Cl. 62-374.000.

Frink, Richard C.: *See*—
Kaplan, Steven E.; and Frink, Richard C., 4,518,770, Cl. 528-487.000.

Frito-Lay, Inc.: *See*—
Ash, Robin T., 4,517,789, Cl. 53-545.000.
Kreager, William D., 4,517,787, Cl. 53-450.000.
Kreager, William D., 4,517,790, Cl. 53-552.000.

Frohberger, Paul-Ernst: *See*—
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,518,600, Cl. 514-256.000.

Frohlich, Jurg: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Riberi, Bernd; and Frohlich, Jurg, 4,518,761, Cl. 528-67.000.

Frost, Charles B., to United States of America, Energy. Rigid zeolite containing polyurethane foams. 4,518,718, Cl. 521-122.000.

Frost, Richard B., to Unisearch Limited. Co-axial tube surgical infusion/suction cutter tip. 4,517,977, Cl. 128-305.000.

Fuchs, Otto, to Burroughs Corporation. Back-bar attachment and associated fixture. 4,518,940, Cl. 335-285.000.

Fuher, John: *See*—
Bantick, John R.; Fuher, John; Hardern, David N.; and Lee, Thomas B., 4,518,612, Cl. 514-457.000.

Fuji Electric Co., Ltd.: *See*—
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, 4,518,962, Cl. 340-870.280.

Fuji Heavy Industries Ltd.: *See*—
Watanabe, Masaru; Sakai, Toshihide; and Takase, Toshio, 4,517,882, Cl. 98-6.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Hara, Kazuo; and Abe, Kunihiro, 4,519,089, Cl. 377-16.000.

Fuji Photo Film Co., Ltd.: *See*—
Hirano, Tsumoru; Umemoto, Makoto; and Hirano, Mitsunori, 4,518,687, Cl. 430-548.000.
Inuiya, Masafumi, 4,518,864, Cl. 250-578.000.
Kato, Mikihiko; Komine, Shigeo; Kawamata, Toshio; Morita, Kazuhiko; and Sato, Tsunehiko, 4,518,626, Cl. 427-48.000.
Kobayashi, Hidetoshi; Takahashi, Toshiro; Hirano, Shigeo; Hirose, Takeshi; and Adachi, Keiichi, 4,518,682, Cl. 430-543.000.
Murakoshi, Makoto; and Ota, Takahiro, 4,517,976, Cl. 128-303.150.
Nakayama, Takao, 4,518,668, Cl. 430-49.000.
Noguchi, Yasuhiro; and Mihara, Yuji, 4,518,689, Cl. 430-574.000.
Ohtsuka, Shuichi, 4,518,252, Cl. 355-133.000.
Oishi, Kengo; and Suzuki, Osamu, 4,518,134, Cl. 242-199.000.
Okita, Tsutomu; and Naruo, Kyoichi, 4,518,656, Cl. 428-403.000.
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,518,466, Cl. 204-28.000.
Takeda, Hideo; and Sato, Tsunehiko, 4,518,637, Cl. 427-359.000.
Yagihara, Morio; Ikegawa, Akihiko; Ono, Mitsunori; and Mihara, Yuji, 4,518,685, Cl. 430-505.000.
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,518,354, Cl. 430-527.000.

Fuji, Tatsuo, to Nippon Electric Co., Ltd. MNOS Type non-volatile memory device and method of manufacturing the same. 4,519,051, Cl. 365-184.000.

Fuji Xerox Co., Ltd.: *See*—
Hamano, Toshihisa, 4,517,733, Cl. 29-572.000.
Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, 4,518,999, Cl. 358-285.000.
Moriguchi, Haruhiko; and Inui, Toshiharu, 4,518,645, Cl. 428-212.000.
Saitoh, Hiroyuki; and Kurata, Masami, 4,518,987, Cl. 358-75.000.
Saitoh, Hiroyuki; and Kurata, Masami, 4,518,988, Cl. 358-75.000.
Wakatsuki, Susumu, 4,518,381, Cl. 493-444.000.

Fujieda, Mamoru: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.

Fujii, Akio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.

Fujimoto, Hirotsugu: *See*—
Takaku, Kazuo; Naruse, Akisuke; Fujimoto, Hirotsugu; and Kimura, Hiroshi, 4,518,560, Cl. 376-245.000.

Fujimoto, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for forming oblique groove in semiconductor device. 4,517,769, Cl. 51-105.00R.

Fujimura, Fumio; Satake, Toshimi; Iwaguro, Makoto; and Minami, Toshiaki, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 4,518,977, Cl. 346-209.000.

Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, to Taiho Pharmaceutical Company Limited. Piperazine derivative and analgesic composition containing the same. 4,518,712, Cl. 514-255.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, to Hitachi, Ltd.; and Showa Denko K.K. Sheet-shaped polymer secondary battery of layer built type. 4,518,665, Cl. 429-153.000.

Fujita, Mituo, to Kabushiki Kaisha Shinsei Industries. Manually-operated labeler. 4,518,454, Cl. 156-541.000.

Fujitsu Fanuc Limited: *See*—
Kawada, Shigeki; and Ishida, Hiroshi, 4,518,916, Cl. 324-173.000.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,519,026, Cl. 364-167.000.

Fujitsu Limited: *See*—
Iwasaki, Tomonobu, 4,518,865, Cl. 307-200.00A.
Oshikawa, Yoshihiro, 4,517,732, Cl. 29-571.000.
Suzuki, Yasuo; Hirao, Hiroshi; and Nagasawa, Masanori, 4,518,873, Cl. 307-451.000.

Fujiwara, Michiaki: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,517,794, Cl. 57-304.000.

Fukami, Tadashi: *See*—
Tsurushima, Katsuaki; Furuya, Tsuneo; and Fukami, Tadashi, 4,519,058, Cl. 369-53.000.

Fukasawa, Hideki, to Sony Corporation. Signal processing circuits. 4,518,925, Cl. 330-51.000.

Fukuchi, Masakazu: *See*—
Tarumi, Noriyoshi; Okamoto, Yukio; Kimura, Kiyoshi; Fukuchi, Masakazu; Miwa, Tadashi; and Ito, Kunio, 4,518,976, Cl. 346-153.100.

Fukui, Izumu: *See*—
Yano, Takeshi; Fukui, Izumu; Hamatsuki, Takeshige; Sato, Eiichi; and Inui, Osamu, 4,518,887, Cl. 310-328.000.

Fukuoka, Kenji; Ida, Masatoshi; Goto, Atsuo; Akagi, Toshimasa; Imai, Masaharu; and Kimura, Kenji, to Olympus Optical Co., Ltd. Static induction transistor image sensor with noise reduction. 4,518,863, Cl. 250-578.000.

Fukuoka, Yoshitaka; and Komine, Toshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for packaging electronic parts. 4,517,738, Cl. 29-840.000.

Fukushima, Isao; Kobori, Yasunori; Nishijima, Hideo; and Masuda, Yoshinori, to Hitachi, Ltd. Motor control apparatus. 4,518,901, Cl. 318-328.000.

Fukuyama, Yasuo: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,517,719, Cl. 29-124.000.

Fultz, Carl, Jr; and Fultz, Phyllis D. W. Manipulable doll. 4,518,366, Cl. 446-366.000.

Fultz, Phyllis D. W.: *See*—
Fultz, Carl, Jr; and Fultz, Phyllis D. W., 4,518,366, Cl. 446-366.000.

Fuminier, Claude B., to Pont-A-Mousson S.A. Method and apparatus for cutting a cast iron pipe. 4,517,867, Cl. 82-101.000.

Funasaki, Ken; Iijima, Toshiki; and Kagohata, Tsuneo, to Hitachi, Ltd. Temperature control apparatus for automobile air-conditioning systems. 4,518,032, Cl. 165-12.000.

Fundakowski, Richard A.: *See*—
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.

Furco, Samuel J. Comb for geometric hair styling. 4,517,998, Cl. 132-11.00R.
Furuhashi, Shoji: *See*—
Ishigami, Kazuhiro; Furuhashi, Shoji; and Yuzawa, Haruo, 4,517,945, Cl. 123-425.000.
Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,518,726, Cl. 524-32.000.
Furuya, Tsuneo: *See*—
Tsurushima, Katsuaki; Furuya, Tsuneo; and Fukami, Tadashi, 4,519,058, Cl. 369-53.000.
G.D Societa' per Azioni: *See*—
Seragnoli, Enzo; and Mattei, Riccardo, 4,517,871, Cl. 83-677.000.
Gabel, Edward R.; Puumala, Edward J.; and LeVasseur, Rodney J., to Data Card Corporation. Magnetic stripe character applying module. 4,518,853, Cl. 235-449.000.
Gabriele, Leonard A., to Lear Siegler, Inc. Pot broach. 4,518,289, Cl. 409-244.000.
Gagliani, John: *See*—
Long, John V.; and Gagliani, John, 4,518,717, Cl. 521-109.100.
Gagnaire, Philippe: *See*—
Godard, Gerard; Joubert, Daniel; and Gagnaire, Philippe, 4,518,516, Cl. 252-91.000.
Galliher, Kenneth R.: *See*—
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.
Gallina, Damian J. Hemorrhoid and anorectal disease treatment method. 4,518,583, Cl. 424-80.000.
Gallitzendorfer, Joseph; Pfeiffer, Peter; Tomforde, Johann; Parisch, Jochen; and Zweigart, Gerhard, to Daimler-Benz Aktiengesellschaft. Water guide channel for motor vehicles. 4,518,197, Cl. 296-213.000.
Gallusser, David O., to Allied Corporation. One piece hermaphroditic contact for an electrical connector and a method of making the contact. 4,518,213, Cl. 339-48.000.
Garcia, Moises R., deceased (by Garcia, Teresa A., personal representative), to United States of America, Army. Wheel alignment tool. 4,517,862, Cl. 81-119.000.
Garcia, Teresa A., personal representative: *See*—
Garcia, Moises R., deceased, 4,517,862, Cl. 81-119.000.
Gardner, John F.; and Hobson, David, to Xomox Corporation. Valve assembly and method of making same. 4,518,149, Cl. 251-144.000.
Garg, Diwaker: *See*—
Schweigharett, Frank; Hoover, David S.; and Garg, Diwaker, 4,518,479, Cl. 208-8.0LE.
Garito, Jon C.; and Ellman, Alan G. Electrosurgical electrode for matrisectomy. 4,517,975, Cl. 128-303.130.
Garland Manufacturing Co.: *See*—
Otto, Ronald F.; and Kempel, John J., 4,518,026, Cl. 160-232.000.
Garner, Daniel C.: *See*—
Gillett, James E.; Garner, Daniel C.; Wineman, Arthur L.; and Robey, Robert M., 4,517,927, Cl. 122-510.000.
Garretson, Oliver R.: *See*—
Okubo, Masao; Yoshimitsu, Yasuro; Nakai, Fumio; and Garretson, Oliver R., 4,518,914, Cl. 324-158.00F.
Garrett, Charles B., to Varian Associates, Inc. Wafer transport system. 4,518,078, Cl. 198-775.000.
Garrett Corporation, The: *See*—
Jamison, Terry, 4,517,803, Cl. 60-611.000.
Kobayashi, Robert J.; Nancarrow, James H.; and Alger, Jeffrey L., 4,517,802, Cl. 60-606.000.
Gartner, Karl, to Josef Gartner & Co. Device for controlling the temperature of rooms in a building. 4,518,033, Cl. 165-53.000.
Gas Conditioning Industries, Inc.: *See*—
Rawson, William E., 4,518,396, Cl. 48-196.00R.
Gass, Wanda K.: *See*—
Magar, Surendar; and Gass, Wanda K., 4,519,031, Cl. 364-200.000.
Gastaldo, Giancarlo, to Ing. C. Olivetti & C., S.p.A. Transparent antireflection varnish for glass supports, and related varnishing method for glass video screens. 4,518,730, Cl. 524-114.000.
Gates Data Products, Inc.: *See*—
Watkins, Richard L., 4,518,833, Cl. 200-5.00A.
Gattiker, Anton: *See*—
Taylor, Charles F.; Wnukiewicz, Stanley A., Jr.; and Gattiker, Anton, 4,518,240, Cl. 354-312.000.
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Multi-turn coils of controlled pitch for electromagnetic casting. 4,518,030, Cl. 164-503.000.
Gavronsky, German, to Pitney Bowes Inc. Module latching mechanism. 4,518,207, Cl. 312-107.500.
Gaz de France: *See*—
Pistien, Jacques F., 4,518,346, Cl. 431-266.000.
GCA Corporation: *See*—
Weber, T. Jerome, 4,518,848, Cl. 219-388.000.
Geary, Thomas B.: *See*—
Longenecker, Kenneth G.; and Geary, Thomas B., 4,518,983, Cl. 357-81.000.
Gebauer, Hartmut: *See*—
Weber, Karl-Heinz; Beckmann, Wolfgang; and Gebauer, Hartmut, 4,518,285, Cl. 405-302.000.
Gebauer, Ludwig; Irmscher, Hans-Jurgen; Lang, Gusztav; and Mauthe, Peter, to Hilti Aktiengesellschaft. Hardenable synthetic resin composition and its use. 4,518,283, Cl. 405-260.000.
Gebeke, Charles D., to Minnesota Mining and Manufacturing Company. Slack limiter for a magnetic tape cassette. 4,518,135, Cl. 242-199.000.
Geboers, Josephus J. A.; and Janssen, Daniel J. G., to U.S. Philips Corporation. Transmission circuit for an electronic telephone set. 4,518,828, Cl. 179-81.00R.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH: *See*—
Weber, Karl-Heinz; Beckmann, Wolfgang; and Gebauer, Hartmut, 4,518,285, Cl. 405-302.000.
GEC Avionics Limited: *See*—
Pudsey, David G., 4,519,069, Cl. 370-85.000.
Gee, Elmer M. Seaming tool. 4,517,724, Cl. 29-275.000.
Gehrman, Sybil H.; and Porubcan, Randolph S., to Chr. Hansen's Laboratory, Inc. Stabilized liquid bacterial suspension for oral administration to animals. 4,518,696, Cl. 435-253.000.
Gehrmann, Klaus; Ohorodnik, Alexander; Rosenthal, Johannes; and Schafer, Stefan, to Hoechst Aktiengesellschaft. Process for making methyldichlorophosphane. 4,518,538, Cl. 260-543.00P.
Geiger, Friedhelm: *See*—
Bolze, Rudolf; Geiger, Friedhelm; Spindler, Manfred; and Tanner, Herbert, 4,518,801, Cl. 562-559.000.
Gelfand, Jan, to Krupp-Koppers GmbH. Support for batteries of coking furnaces heated from the top. 4,518,461, Cl. 202-270.000.
Genentech, Inc.: *See*—
Olson, Kenneth C., 4,518,526, Cl. 260-112.00R.
General Audio-Visual Inc.: *See*—
LiDonnici, Kenneth; and Dituri, Angelo, 4,518,233, Cl. 353-87.000.
General Electric Company: *See*—
Crivello, James V., 4,518,788, Cl. 560-064.000.
Cusano, Dominic A.; Greskovich, Charles D.; and DiBianca, Frank A., 4,518,545, Cl. 264-1.200.
Donaldson, Charles W., 4,518,257, Cl. 356-375.000.
Fischer, Larry E.; Sridhar, Bettadapur N.; and Bean, Jackie E., 4,518,559, Cl. 376-230.000.
Gigl, Paul D.; and Cho, Hyun S., 4,518,659, Cl. 428-539.500.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,518,546, Cl. 264-1.200.
Nichols, Roy F., Jr., 4,518,646, Cl. 428-248.000.
Richards, William D. C.; and Straub, Harry, 4,518,175, Cl. 285-47.000.
Stackhouse, Kenneth B.; and Hill, William D., 4,519,090, Cl. 377-29.000.
Thompson, Craig R.; Carnes, Ronald C.; and Naumann, Ted F., Jr., 4,517,840, Cl. 73-644.000.
Traver, Frank J., 4,518,727, Cl. 524-35.000.
General Electric Company, p.l.c., The: *See*—
Breeze, Gerald D.; and Elliott, Donald C., 4,519,013, Cl. 361-384.000.
General Foods Incorporated: *See*—
Tapscott, Donald A., 4,517,827, Cl. 73-45.400.
General Instrument Corp.: *See*—
Grossar, Francis, 4,518,835, Cl. 200-61.45M.
General Motors Corporation: *See*—
Gloomis, Lawrence A., 4,518,130, Cl. 242-107.000.
General Safety Corporation: *See*—
Schmidt, Timothy J., 4,518,132, Cl. 242-107.40A.
General Signal Corporation: *See*—
Ross, Steven L.; and Tachovsky, Otto H., 4,517,751, Cl. 34-10.000.
Stinson, Walter J.; and Phillips, Larry J., 4,518,146, Cl. 251-28.000.
Genetics Institute, Inc.: *See*—
Rozzell, J. David, 4,518,692, Cl. 435-116.000.
Gentry, Elvin O. Crankshaft inspection apparatus and method. 4,517,717, Cl. 29-6.000.
George, Rick A., to NCR Corporation. Position indicator means for a high speed printer or the like. 4,518,272, Cl. 400-705.100.
Geosource Inc.: *See*—
Tantillo, Donnie J.; Kratochvil, David F.; Moore, Robert G.; and Browne, Edward M., 4,519,052, Cl. 367-79.000.
Geracitano, Vincent. Inflatable reversible liferaft. 4,517,914, Cl. 114-345.000.
Gere, Pal: *See*—
Takacs, Istvan; Kerey, Gyorgy; Illes, Janos; Rudolf, Peter; Gere, Pal; Czebe, Laszlo ; and Neszmelyi, Erzsebet, 4,518,771, Cl. 536-21.000.
Geremia, Leo F., to Haydon Switch & Instrument, Inc. Rotary and/or push-pull wiping switch. 4,518,832, Cl. 200-4.000.
Gerlach Industries: *See*—
Iannelli, Frank M.; and James, David H., 4,518,104, Cl. 222-146.600.
Geschka, Hugo-Werner, to E. Blum GmbH & Co. Electric machine, such as transformer choke, constant-voltage regulator or the like. 4,518,942, Cl. 336-178.000.
Gessell, Donald E., to Du Pont de Nemours, E. I., and Company. Hydrocarbon soluble catalyst supports and resultant polymerization catalysts. 4,518,706, Cl. 502-104.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; and Pohlmann, Klaus D., 4,518,284, Cl. 405-296.000.
Geyer, Willi: *See*—
Forster, Alfred; Geyer, Willi; and Kober, Leo, 4,518,196, Cl. 296-204.000.
Gibas, Christoph: *See*—
Bartholomaus, Reiner; and Gibas, Christoph, 4,518,938, Cl. 335-262.000.
Gibson-Stephens Institute: *See*—
Hruby, Victor J.; and Mosberg, Henry, 4,518,711, Cl. 514-11.000.
Giddings, Gary M.: *See*—
Wilkinson, Richard L.; and Giddings, Gary M., 4,519,004, Cl. 358-342.000.

Giessner, George J., to Heinemann Electric Company. Bimetallic circuit breaker with an auxiliary switch. 4,518,943, Cl. 337-68.000.
Gigl, Paul D.; and Cho, Hyun S., to General Electric Company. Sweep through process for making polycrystalline compacts. 4,518,659, Cl. 428-539.500.
Giguere, Irving J., to Superior Electric Company, The. Digital motor control method and means. 4,518,907, Cl. 318-696.000.
Gillett, James E.; Garner, Daniel C.; Wineman, Arthur L.; and Robey, Robert M., to United States of America, Energy. Steam generator for liquid metal fast breeder reactor. 4,517,927, Cl. 122-510.000.
Gillhaus, Horst; Hegewaldt, Fritz; Faber, Wolfgang; Baer, Jurgen; and Toplak, Ernst, to Brown, Boveri & Cie. AG. Industrial oven with air recirculation for heat treating processes. 4,518,352, Cl. 432-199.000.
Gilson, Alan P., to United States of America, Air Force. Optical disc transport system. 4,519,055, Cl. 369-37.000.
Gilvydis, Jaunutis B., to United States of America, Army. Observation system for military vehicles. 4,518,990, Cl. 358-87.000.
Gini, Donald; and Stockton, Dean B., to International Business Machines Corporation. Method and apparatus for coating magnetic recording media. 4,518,634, Cl. 427-128.000.
Glaenzer Spicer: *See*—
Orain, Michel A., 4,518,370, Cl. 464-113.000.
Glaser, Hellmut I.: *See*—
Perkins, Richard A.; Brady, William C.; and Glaser, Hellmut I., 4,518,406, Cl. 65-1.000.
Glaxo Group Limited: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; Carey, Linda; and Blatcher, Philip, 4,518,598, Cl. 514-212.000.
Gleason, Patricia A.; and Brase, Ingrid E., to National Starch and Chemical Corporation. Drilling mud dispersants. 4,518,510, Cl. 252-8.50C.
Glennon, Timothy F., to Sundstrand Corporation. Ripple reduction circuit for an inverter. 4,519,022, Cl. 363-41.000.
Gloomis, Lawrence A., to General Motors Corporation. Lap and shoulder belt retractor. 4,518,130, Cl. 242-107.000.
Glyzin, Vladimir I.: *See*—
Rusakova, Svetlana V.; Glyzin, Vladimir I.; Kocherga, Stepan I.; Ananieva, Alla A.; and Libizova, Larisa F., 4,518,592, Cl. 424-195.100.
Godard, Gerard; Joubert, Daniel; and Gagnaire, Philippe, to Rhone-Poulenc Chimie De Base. Sodium metasilicate particulates and detergent compositions comprised thereof. 4,518,516, Cl. 252-91.000.
Goebel, Franz, to GTE Communications Products Corp. Method of fabrication of an electrochemical cell. 4,517,736, Cl. 29-623.200.
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., to University Patents, Inc.; and Contracap, Inc. Conforming valved cervical cap assembly and in-situ molding method. 4,517,970, Cl. 128-131.000.
Goglio, Luigi, to Fres-co System USA, Inc. Sealed flexible container with non-destructive peelable opening. 4,518,087, Cl. 206-632.000.
Gogniat, Paul; and Loth, Eric. Watch case. 4,518,093, Cl. 220-82.00R.
Goi, Kowichi, to Laurel Bank Machine Co., Ltd. Guide for use in a bank note handling machine. 4,518,158, Cl. 271-9.000.
Goins, Robert R., to Phillips Petroleum Company. Apparatus for blending solids or the like. 4,518,260, Cl. 366-134.000.
Goodell, Bradley D., to Deere & Company. Variable displacement pump system. 4,518,320, Cl. 417-217.000.
Goodrich, Gary B.; and Belani, Jadish G., to National Semiconductor Corporation. High temperature stable adhesive for semiconductor device packages, low-cost semiconductor device package and process. 4,518,735, Cl. 524-403.000.
Gordon, Linda A.: *See*—
Tarello, William R.; Lopez, Claudio; Gordon, Linda A.; Whalen, Thomas D.; and Harvey, William B., 4,518,384, Cl. 604-61.000.
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., to Ciba Geigy Corporation. Azetidinone-4-disulfides as intermediates for thia-aza compounds with a beta-lactam ring. 4,518,533, Cl. 260-245.400.
Goto, Atsuo: *See*—
Fukuoka, Kenji; Ida, Masatoshi; Goto, Atsuo; Akagi, Toshimasa; Imai, Masaharu; and Kimura, Kenji, 4,518,863, Cl. 250-578.000.
Goto, Yasuo: *See*—
Murata, Tomoji; Hayashi, Masamichi; Goto, Yasuo; and Sakurai, Seiichi, 4,518,249, Cl. 355-67.000.
Gould, Bruce M., to Challenge-Cook Brothers, Inc. Food processor. 4,517,888, Cl. 99-472.000.
Gournay, Luke S.: *See*—
Lyle, W. D., Jr.; and Gournay, Luke S., 4,517,836, Cl. 73-152.000.
Goursat, Albert-Gilbert: *See*—
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Govoni, Gabriele; Corazzari, Canzio; Di Stefano, Giovanni; and Loconsolo, Mauro, to Montedison S.p.A. Fluid bed reactor. 4,518,750, Cl. 526-68.000.
Graf, Harlan G.; and Janssen, Harry R., to Conoco Inc. Process for improving product yields from delayed coking. 4,518,487, Cl. 208-131.000.
Graham, John W.; and Sinclair, A. Richard. Method for treating subterranean formations. 4,518,039, Cl. 166-276.000.
Graham, Tommy E.: *See*—
Croskell, Henry; and Graham, Tommy E., 4,518,399, Cl. 55-16.000.
Graham, William R., to TI (Group Services) Limited. Method of making a tube in sheet heat exchanger. 4,517,721, Cl. 29-157.30C.
Gran-Quartz Trading, Inc.: *See*—
deKok, Peter T.; and Phildius, John, 4,517,954, Cl. 125-15.000.
Grant, Ian: *See*—
Beversdorf, Wallace D.; Erickson, Lawrence R.; and Grant, Ian, 4,517,763, Cl. 47-58.000.
Grant, Willie T. Automatic damper operator. 4,518,116, Cl. 236-1.00B.
Grasser, Leo, to Siemens AG. Method for forming silicon oxide films. 4,518,630, Cl. 427-93.000.
Grasso, Alfie L., to Micropore International Limited. Electric cooker having temperature warning means. 4,518,850, Cl. 219-505.000.
Gravi-Mechanics: *See*—
Dedolph, Richard R., 4,517,764, Cl. 47-77.000.
Gray, Michael J.: *See*—
Cox, Michael; Gray, Michael J.; and Duke, Phillip W., 4,518,420, Cl. 75-26.000.
Gray, Thomas J., to Olin Corporation. Raney alloy coated cathode for chlor-alkali cells. 4,518,457, Cl. 156-656.000.
Greco, Alberto; and Bertolini, Guglielmo, to Enichimica Secondaria, S.p.A. Polyoxyalkylenediol-α,ω-bisallyl polycarbonate useful as a base for sealants and process for its preparation. 4,518,766, Cl. 528-370.000.
Green, Arthur A.; and Black, Robert H. Method for treating the upper layer of a body of water. 4,518,506, Cl. 210-747.000.
Green, Ian M., to EMI Limited. Program storage hardware with security scheme. 4,519,036, Cl. 364-200.000.
Green, Russell D., to Dentsply Research & Development Corp. Ultrasonic dental file and method of determining failure resistant lengths thereof. 4,518,356, Cl. 433-102.000.
Greenburg, Jimmy L., to Dover Corporation. Valve with split ring retainer. 4,518,150, Cl. 251-306.000.
Greene, Donald F.; and Urban, Virginia L., to Sterling Drug Inc. Hydrogen peroxide disinfecting and sterilizing compositions. 4,518,585, Cl. 424-130.000.
Greene, Edward S.: *See*—
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Greene, Richard M., to Solid State Scientific, Inc. Stable rail sense amplifier in CMOS memories. 4,518,879, Cl. 307-530.000.
Greene, Ted J.; and Irons, George P., to United States Manufacturing Company. Composite orthosis for ankle sprains and the like. 4,517,968, Cl. 128-80.00H.
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process for removing light oil from solids. 4,518,458, Cl. 159-47.100.
Greenwell, Joseph D., to R. A. Jones & Co. Inc. Orbital feeder. 4,518,301, Cl. 414-129.000.
Gregory, Paul E., Jr.: *See*—
Sneed, Scott W.; Schwam, Bill R.; and Gregory, Paul E., Jr., 4,517,714, Cl. 28-103.000.
Greiner, Ulrich: *See*—
Engelhardt, Friedrich; and Greiner, Ulrich, 4,518,745, Cl. 525-326.600.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., to General Electric Company. Preparation of yttria-gadolinia ceramic scintillators by sintering and gas hot isostatic pressing. 4,518,546, Cl. 264-1.200.
Greskovich, Charles D.: *See*—
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Griesdorn, Carl P.: *See*—
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Griffith, Ronald C., to Pennwalt Corporation. 1,2,3,4-Tetrahydro-1-aminomethyl-4-phenyl isoquinolines. 4,518,779, Cl. 546-144.000.
Grimes, Donald: *See*—
Ronco, Kenneth J.; Sommer, Robert; Nigel, Ken; Grimes, Donald; Zirbes, James A.; and Stacey, Robert E., 4,518,077, Cl. 198-731.000.
Grittmann, Gunter: *See*—
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Grollimund, Everett C.; Smick, William H., III; and Brookman, Donald L., to Philip Morris Incorporated. Self-cleaning porosimeter. 4,517,825, Cl. 73-38.000.
Gross, Thomas A. O.: *See*—
Barrett, Raymond L., Jr.; and Gross, Thomas A. O., 4,519,066, Cl. 370-24.000.
Grossar, Francis, to General Instrument Corp. Force responsive switch. 4,518,835, Cl. 200-61.45M.
Grossman, Steven J.; and Onder, Kemal, to Upjohn Company, The. Anionic polymerization of lactam with azetidine-2,4-dione promoter. 4,518,765, Cl. 528-314.000.
Grot, Walther G.; Rivers, Joseph T.; and Silva, Raimund H., to Du Pont de Nemours, E. I., and Company. Protective clothing of fabric containing a layer of highly fluorinated ion exchange polymer. 4,518,650, Cl. 428-286.000.
Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,518,790, Cl. 560-118.000.
Grun, Charles: *See*—
Solomon, Frank; and Grun, Charles, 4,518,705, Cl. 502-101.000.
Grundfos A/S: *See*—
Jensen, Niels D.; Nielsen, Kurt F.; and Larden, Bent, 4,518,318, Cl. 417-53.000.
Gruner, Ronald H.: *See*—
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Grunwald, Raymond M.: *See*—
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Grzeczkowski, Thomas V.: *See*—
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Grzybowski, Bohdan; and Horbal, Mark T., to Acrobe Technology Inc. Manipulator apparatus. 4,518,308, Cl. 414-735.000.

GTE Automatic Electric Inc.: *See*—
Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,518,211, Cl. 339-17.0LM.

GTE Communication Systems Corporation: *See*—
Fayette, Brad K., 4,519,025, Cl. 364-141.000.

GTE Communications Products Corp.: *See*—
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GTE Communications Systems Corporation: *See*—
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GTE Laboratories Incorporated: *See*—
Proud, Joseph M.; Budinger, A. Bowman; Riseberg, Leslie A.; and Byszewski, Wojciech W., 4,518,897, Cl. 315-260.000.

GTE Products Corporation: *See*—
Swanson, Steven E., 4,518,220, Cl. 350-96.200.

Guicquero, Jean P., to Chryso S.A. Fluidizing agents for hydraulic bonding materials; hydraulic bonding materials containing said fluidizing agents; method of making and using same. 4,518,725, Cl. 524-3.000.

Guiles, Chester L.: *See*—
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,518,018, Cl. 138-130.000.

Guittard, Pierre; Jarry, Philippe; Ducarre, Alphonse; and Haji, Lazhar, to U.S. Philips Corporation. Semiconductor device for the vacuum-emission of electrons. 4,518,980, Cl. 357-30.000.

Gulf Research & Development Company: *See*—
Templin, Philip R.; and Fareri, Elizabeth L., 4,518,394, Cl. 44-38.000.

Gullfiber AB: *See*—
Ransheim, Anders P.; Thomsen, Arne; and Holmgren, Per, 4,517,845, Cl. 73-861.050.

Gultsev, Igor V.: *See*—
Braginsky, Yakov I.; Gultsev, Igor V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; and Yaroshenko, Yury F., 4,517,707, Cl. 17-71.000.

Gunderson, Charles; and Hammond, Henry W., to Sanders Associates, Inc. Graphics plotter turret head. 4,518,972, Cl. 346-139.00R.

Gunn, Damon M., deceased; and Gunn, Robert M., administrator. Blood viscosity instrument. 4,517,830, Cl. 73-57.000.

Gunn, Robert M., administrator: *See*—
Gunn, Damon M., deceased; and Gunn, Robert M., administrator, 4,517,830, Cl. 73-57.000.

Guntaka, Ramareddy V., to Research Corporation. DNA promoter sequence of Avian tumor virus and use thereof for enhanced gene expression in *E. coli*. 4,518,690, Cl. 435-71.000.

Gusman, Moisei T.: *See*—
Baldenko, Dmitry F.; Gusman, Moisei T.; and Semenets, Valery I., 4,518,049, Cl. 175-107.000.

Gustafson, Bruce L., to Eastman Kodak Company. Process for the selective production of olefins from synthesis gas. 4,518,714, Cl. 518-721.000.

H.E.M.E. International Limited: *See*—
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Haarmann, Walter: *See*—
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,518,596, Cl. 514-232.000.

Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,518,617, Cl. 426-231.000.

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann. Process for continuously making an endless wafer laminate of uniform width, consisting of individual wafer sheet layers and intervening cream layers. 4,518,617, Cl. 426-231.000.

Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,518,617, Cl. 426-231.000.

Habbal, Fawwaz: *See*—
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Haberli, Peter, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Sabot projectile. 4,517,899, Cl. 102-521.000.

Habro, Bertil. Omnidirectional reflector with helically turned segments. 4,518,224, Cl. 350-606.000.

Hackman, Charles H. Rotary peristaltic pump. 4,518,327, Cl. 417-477.000.

Haddad, Paul R.: *See*—
Alexander, Peter W.; and Haddad, Paul R., 4,518,463, Cl. 204-1.00T.

Haefner, John S.: *See*—
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Hagemann, Hermann: *See*—
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Hagio, Tsuyoshi: *See*—
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Hagiwara, Toshio: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,518,466, Cl. 204-28.000.

Hailey, Robert W. Method of producing metal alloys with high modulus of elasticity. 4,518,441, Cl. 148-11.50P.

Haji, Lazhar: *See*—
Guittard, Pierre; Jarry, Philippe; Ducarre, Alphonse; and Haji, Lazhar, 4,518,980, Cl. 357-30.000.

Halbritter, Klaus: *See*—
Eckhardt. Heinz; Halbritter, Klaus; and Rohr, Wolfgang, 4,518,785, Cl. 549-453.000.

Halcomb, F. Joseph, III; and Allen, C. Wayne, to Zimmer, Inc. Prosthetic gauge. 4,517,969, Cl. 128-92.00E.

Hale, John M.: *See*—
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Hall, Stephen M., to Quantum Lighting Limited. Ceiling light fitting. 4,519,019, Cl. 362-147.000.

Halliburton Company: *See*—
Middleton, James D., 4,518,040, Cl. 166-307.000.

Halpern, Yuval, to Borg-Warner Chemicals, Inc. Bis(beta-pentabromophenoxyethyl) succinate, a flame retardant for ABS. 4,518,795, Cl. 560-193.000.

Haltof, Garry P., to Caldwell Manufacturing Company. Adjustable friction sash holder. 4,517,766, Cl. 49-417.000.

Hama, Yoshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Rotation control mechanism for diaphragm-operating ring in interchangeable objective for photographic camera. 4,518,238, Cl. 354-270.000.

Hamada, Fumio: *See*—
Kato, Kazuo; Hamada, Fumio; and Ito, Kenji, 4,518,683, Cl. 430-546.000.

Hamano, Toshihisa, to Fuji Xerox Co., Ltd. Process for fabricating thin film image pick-up element. 4,517,733, Cl. 29-572.000.

Hamatsuki, Takeshige: *See*—
Yano, Takeshi; Fukui, Izumu; Hamatsuki, Takeshige; Sato, Eiichi; and Inui, Osamu, 4,518,887, Cl. 310-328.000.

Hamer, Howard, to United States of America, Army. Error correction method and apparatus. 4,519,079, Cl. 371-38.000.

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Hanaoka, Tadashi; and Umezu, Hiroaki, to Misawa Home Co., Ltd. Heat utilizing system using internal combustion engine. 4,517,799, Cl. 62-323.100.

Hanggi, Rolf. Pen with built-in illumination. 4,518,274, Cl. 401-195.000.

Hanks, Thomas W.: *See*—
Wiegardt, Gordon K.; Hanks, Thomas W.; and Kittle, Carl E., 4,518,044, Cl. 172-7.000.

Hanover Research Corporation: *See*—
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,518,458, Cl. 159-47.100.

Hanson, David K. Power tool drive attachment. 4,518,371, Cl. 474-114.000.

Hanson, Kerry A., to Texas Instruments Incorporated. Bilateral digital data transmission system. 4,519,083, Cl. 375-9.000.

Hara, Kazuo; and Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. System for detecting neutral state of a transmission of an engine for vehicles. 4,519,089, Cl. 377-16.000.

Hara, Tsutomu: *See*—
Takagi, Toshihiko; Kobayashi, Yoshikazu; Suzuki, Yoshiji; and Hara, Tsutomu, 4,519,064, Cl. 369-275.000.

Harada, Hajime, to Nihon Kohden Corporation. Pulse transformer for switching power supplies. 4,518,941, Cl. 336-69.000.

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Imada, Akira; Harada, Setsuo; and Asai, Mitsuko, 4,518,529, Cl. 260-245.20T.

Harada, Takashi: *See*—
Kaji, Yasumasa; Isomura, Shigenori; Harada, Takashi; and Sakakibara, Shuji, 4,517,948, Cl. 123-489.000.

Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Tanaka, Hirotoshi, to Hitachi, Ltd. Superconductive large-scale integrated circuit chip. 4,518,868, Cl. 307-306.000.

Harder, Sven, to Aktieselskabet Jens Villadsens Fabriker. Roof or wall structure. 4,517,783, Cl. 52-481.000.

Hardern, David N.: *See*—
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Harding, Henry W. Pool skimmer. 4,518,495, Cl. 210-169.000.

Harding, John D.: *See*—
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Hardwick, Roy, to Explosive Fabricators, Inc. Method of fabricating a bi-metal tube. 4,518,111, Cl. 228-107.000.

Hare, Bruce L., to Hare, Bruce L., Jr. Apparatus for measuring the shoulder of a drill pipe joint. 4,517,745, Cl. 33-169.00B.

Hare, Bruce L., Jr.: *See*—
Hare, Bruce L., 4,517,745, Cl. 33-169.00B.

Harnish, James R., to Borg-Warner Corporation. Heat pump water heater with supplemental heat supply. 4,517,807, Cl. 62-156.000.

Harris Corporation: *See*—
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Harris, Derek W., to Sodastream Limited. Liquid aerating apparatus. 4,518,541, Cl. 261-27.000.

Harris, Richard K.: *See*—
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Harrison, Derek N.; and Purling, Trevor C., to Flowmetering Instruments Limited. Electromagnetic flowmeter. 4,517,846, Cl. 73-861.120.

Harrison, Richard H., Jr.: *See*—
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Harshbarger, John H.; and Shores, William M., to Visual Information Institute, Inc. Selectable rate sync generator system. 4,518,995, Cl. 358-139.000.

Hart, Reginald J., to Roymere Limited. Apparatus for and method of cooling the core rods of an injection blow moulding machine. 4,518,549, Cl. 264-39.000.

Harvey, Kenneth: *See*—
Hayes, Harry; and Harvey, Kenneth, 4,518,578, Cl. 424-7.100.

Harvey, William B.: *See*—
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Hasegawa, Mineo, to Kewpie Kabushiki Kaisha. Process for eluting egg white lysozyme. 4,518,695, Cl. 435-206.000.

Hashimoto, Hisayoshi; and Tamura, Morio, to Hitachi Construction Machinery Co., Ltd. Shock absorbing device for hydraulic cylinder. 4,517,878, Cl. 91-396.000.

Hassall, Cedric H.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,518,784, Cl. 549-39.000.

Hatakeyama, Yoshiharu; Ishikawa, Tatsuo; and Teshima, Kenzo, to Yoshida Industry Co., Ltd. Method and apparatus for molding a tubular container with a cap. 4,518,554, Cl. 264-262.000.

Hatco Chemical Corporation: *See*—
Chen, Clay T.; Wan, K. Ming; and Chen, Mary S., 4,518,792, Cl. 560-163.000.

Hately, Maurice C., to National Research Development Corporation. Dipole and ground plane antennas with improved terminations for coaxial feeders. 4,518,968, Cl. 343-802.000.

Haug, Theobald; and Stockinger, Friedrich, to Ciba Geigy Corporation. Curable epoxy resin mixtures. 4,518,748, Cl. 525-481.000.

Hauser, Ludwig; and Wanke, Wilhelm, to J.M. Voith GmbH. Press roll for web material. 4,518,460, Cl. 162-361.000.

Hausermann Abrading Process Company: *See*—
Hausermann, Marten C.; and Hausermann, Elmer P., 4,517,768, Cl. 51-58.000.

Hausermann, Elmer P.: *See*—
Hausermann, Marten C.; and Hausermann, Elmer P., 4,517,768, Cl. 51-58.000.

Hausermann, Marten C.; and Hausermann, Elmer P., to Hausermann Abrading Process Company. Orbital polisher. 4,517,768, Cl. 51-58.000.

Hauske, James R.; and Nagel, Arthur A., to Pfizer Inc. 9α-Aza-9α-homoerythromycin compounds, pharmaceutical compositions and therapeutic method. 4,518,590, Cl. 514-29.000.

Havekost, Peter: *See*—
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,518,311, Cl. 415-102.000.

Haws, Spencer K. Automatic hot water recovery system. 4,518,007, Cl. 137-337.000.

Hayakawa, Takaki: *See*—
Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto, 4,518,698, Cl. 435-317.000.

Hayashi, Kiyoshi: *See*—
Kawahara, Yoshihiro; and Hayashi, Kiyoshi, 4,518,975, Cl. 346-153.100.

Hayashi, Masamichi: *See*—
Murata, Tomoji; Hayashi, Masamichi; Goto, Yasuo; and Sakurai, Seiichi, 4,518,249, Cl. 355-67.000.

Hayashi, Munehisa: *See*—
Wachi, Akira; and Hayashi, Munehisa, 4,517,838, Cl. 73-204.000.

Haydon Switch & Instrument, Inc.: *See*—
Geremia, Leo F., 4,518,832, Cl. 200-4.000.

Hayes, Harry; and Harvey, Kenneth, to Colgate-Palmolive Company. Dentifrice composition containing visually clear pigment-colored stripe. 4,518,578, Cl. 424-7.100.

Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; Carey, Linda; and Blatcher, Philip, to Glaxo Group Limited. 1,2,4-Triazole-3-amines, their pharmaceutical compositions and method of use. 4,518,598, Cl. 514-212.000.

Hayford, Robert L., Jr. Video game control console. 4,518,164, Cl. 273-148.00B.

Haythornthwaite, James A. Animal rearing house. 4,517,921, Cl. 119-16.000.

Head, Glenn D., Jr.: *See*—
Rettig, Vernon E.; Bigbee, Marvin L.; Steilen, Ronald M.; and Head, Glenn D., Jr., 4,518,046, Cl. 172-311.000.

Head Lites Corporation: *See*—
Lesley, Gary M., 4,517,685, Cl. 2-170.000.

Hearn, William E.; and Rondeau, Donald J., to United States of America, Energy. Precision absolute value amplifier for a precision voltmeter. 4,518,877, Cl. 307-490.000.

Heathe, William R., to Baxter Technologies Inc. Sliding bearing. 4,518,205, Cl. 308-3.00R.

Heaton, Robert: *See*—
Keltz, Douglas; and Heaton, Robert, 4,518,145, Cl. 251-5.000.

Heckele, Helmut, to Richard Wolf GmbH. Nasal endoscopes. 4,517,962, Cl. 128-6.000.

Hedenberg, William E. Air suspension system. 4,518,171, Cl. 280-711.000.

Hegedus, Karoly, to Aranykalasz Mgtsz. Vehicle with eccentrically mounted wheels. 4,518,176, Cl. 280-229.000.

Hegewaldt, Fritz: *See*—
Gillhaus, Horst; Hegewaldt, Fritz; Faber, Wolfgang; Baer, Jurgen; and Toplak, Ernst, 4,518,352, Cl. 432-199.000.

Hehl, Karl. Injection molding machine with mold changing and mold preconditioning device. 4,518,338, Cl. 425-183.000.

Heiart, Robert B.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Automatic repetitive registration and image wise exposure of sheet substrates. 4,518,667, Cl. 430-22.000.

Heiden, Ulrich; and Atzler, Peter, to Bayerische Motoren Werke A.G. Drivable wheel for the finish grinding or polishing of the surface of a vehicle body or the like. 4,517,773, Cl. 51-336.000.

Heider, Dale J.: *See*—
Heider, Merle J.; Heider, Dale J.; and Heider, Leon J., 4,518,193, Cl. 296-98.000.

Heider, Leon J.: *See*—
Heider, Merle J.; Heider, Dale J.; and Heider, Leon J., 4,518,193, Cl. 296-98.000.

Heider, Merle J.; Heider, Dale J.; and Heider, Leon J. Top closure for a rectangular box and method for using same. 4,518,193, Cl. 296-98.000.

Heinemann Electric Company: *See*—
Giessner, George J., 4,518,943, Cl. 337-68.000.

Helderle, Paul M.: *See*—
Lefebvre, Herve M.; and Helderle, Paul M., 4,518,036, Cl. 166-105.000.

Hendrickson, Larry L.: *See*—
Swerdloff, Michael D.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,518,413, Cl. 71-28.000.

Hendrischk, Wolfgang, to Mannesmann Aktiengesellschaft. Multicolored printing. 4,518,270, Cl. 400-240.400.

Henkel Corporation: *See*—
Hess, Dennis R.; and Antilla, Arthur, 4,518,432, Cl. 106-117.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Bartnik, Friedhelm; Schindler, Joachim; Weiss, Albrecht; and Schmid, Rolf, 4,518,697, Cl. 435-254.000.

Hennon, Erin D.; and Joyner, Robert G., to Dana Corporation. Protective cover assembly. 4,518,017, Cl. 138-96.00R.

Henriksen, Gary L.: *See*—
Kodali, Satyanarayana; Singh, Bhim S.; Whittlesey, Curtis C.; and Henriksen, Gary L., 4,518,663, Cl. 429-18.000.
Whittlesey, Curtis C.; Henriksen, Gary L.; Keryluk, Walter B.; and Wolff, Merle T., 4,518,664, Cl. 429-38.000.

Henry, Arnold W.; Azar, Jack C.; and Sagal, John, to Xerox Corporation. Fusing member for electrostatographic copiers. 4,518,655, Cl. 428-329.000.

Henry, James W., to Sperry Corporation. Control linkage for continuous roll baling machine. 4,517,891, Cl. 100-88.000.

Henry, Rene H.; and Nolf, Jean M. E., to N. V. Raychem S.A. Closure assembly and method of using it. 4,518,448, Cl. 156-86.000.

Hepp, Volker. Mobile event-module. 4,518,267, Cl. 368-107.000.

Hercules Incorporated: *See*—
Pohl, Rudolph L., 4,518,677, Cl. 430-306.000.

Herlihy, Walter C., to Repligen Corporation. In vitro enzymatic process for preparing glucuronides of ester-containing anticholinergics. 4,518,691, Cl. 435-74.000.

Hermann Behr & Sohn GmbH & Co.: *See*—
Vetter, Kurt, 4,518,119, Cl. 239-223.000.

Hermann Heye: *See*—
Monden, Norbert, 4,518,409, Cl. 65-79.000.

Herold, Barry W., to Motorola, Inc. Resistance comparator for switch detection. 4,518,869, Cl. 307-350.000.

Herrin, Melvin B.: *See*—
Eldridge, Charles W., 4,518,379, Cl. 493-334.000.

Herter, Carl J. Method for preparing a low residual alloy steel charge from scrap metal. 4,518,423, Cl. 75-64.000.

Hertz, Darryl W., to Standard Oil Company, The. Degasser-desurger unit. 4,518,403, Cl. 55-194.000.

Hess, Dennis R.; and Antilla, Arthur, to Henkel Corporation. Slag briquette. 4,518,432, Cl. 106-117.000.

Hess, Herman A. Earring fastener. 4,517,816, Cl. 63-12.000.

Hetyei, Joseph, to Thomson-CSF. Pulse arrival time determining device, use thereof in distance-measuring equipment and measuring equipment comprising such a device. 4,518,964, Cl. 343-7.300.

Heusch, Rudolf; Rasshofer, Werner; Reichmann, Wolfgang; and Richartz, Adolf, to Bayer Aktiengesellschaft. Homogeneous, storage-stable polyol compositions of high ethylene glycol content and their use for the production of polyurethanes. 4,518,521, Cl. 252-188.310.

Hewlett-Packard Company: *See*—
Chu, David C.; and Ward, Michael J., 4,519,091, Cl. 377-44.000.
Quimby, Bruce D., 4,517,824, Cl. 73-23.000.
Walsh, Thomas A., 4,518,114, Cl. 228-180.100.

HGM, Inc.: *See*—
Tanner, Howard M. C., 4,517,974, Cl. 128-303.100.

Hibino, Akira: *See*—
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,518,354, Cl. 430-527.000.

Hidaka, Kazutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Tuned small loop antenna and method for designing thereof. 4,518,965, Cl. 343-742.000.

Hiddleston, James N.: *See*—
May, Denis R. W.; and Hiddleston, James N., 4,517,688, Cl. 3-2.000.

Hideaki Takahashi: *See*—
Takahashi, Hideaki; Shoji, Tetsuo; Saitoh, Kiyoshi; Muramatsu, Masamitsu; and Kimura, Kazushige, 4,518,464, Cl. 204-1.00T.

Higashihara, Teruaki; Nonaka, Chiaki; Yoshida, Tadao; and Kawachi, Hideo, to Sony Corporation. Digital audio disc player including apparatus for finding the beginning of a recorded audio signal. 4,519,057, Cl. 369-50.000.

Higuchi, Moeko: *See*—
Ishikawa, Masao; Kobayashi, Kazuhiro; Kimura, Toshihiko; and Higuchi, Moeko, 4,518,680, Cl. 430-393.000.

Hill, Broadus E., Jr., to Du Pont de Nemours, E. I., and Company. Yarn package. 4,518,133, Cl. 242-165.000.

Hill, William D.: *See*—
Stackhouse, Kenneth B.; and Hill, William D., 4,519,090, Cl. 377-29.000.

Hilliker, Richard A.: *See*—
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., 4,517,841, Cl. 73-517.0AV.

Hillman, Gary: *See*—
Devico, Michael J.; and Hillman, Gary, 4,517,752, Cl. 34-58.000.

Hilti Aktiengesellschaft: *See*—
Gebauer, Ludwig; Irmscher, Hans-Jurgen; Lang, Gusztav; and Mauthe, Peter, 4,518,283, Cl. 405-260.000.
Lang, Guaztav; Hoffmann, Armin; and Bisping, Heinz, 4,518,291, Cl. 411-60.000.
Listemann, Peter; and Monch, Sigurd, 4,518,662, Cl. 428-675.000.

Hinderling, Thomas: *See*—
Friedli, Paul; Hinderling, Thomas; and Begle, Guntram, 4,518,909, Cl. 318-566.000.

Hiniker Company: *See*—
Peterson, Richard L.; and Scheurer, Roger J., 4,518,047, Cl. 172-611.000.

Hinn, Werner; and Fecht, Hans-Rudolf, to RCA Corporation. Apparatus for accurate adjustment of kinescope black level bias. 4,518,986, Cl. 358-65.000.

Hintsch, Otto; and Schmitz, Gerd, to Sulzer Brothers Limited. Lubricator for a weft picking element in a weaving machine. 4,518,019, Cl. 139-1.00R.

Hiramatsu, Yasuzo: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, 4,518,712, Cl. 514-255.000.

Hiramoto, Junichi: *See*—
Shiga, Tetsuya; Okawa, Shinichi; Yoshida, Kenichi; and Hiramoto, Junichi, 4,517,982, Cl. 128-635.000.

Hirano, Masami: *See*—
Yamaguchi, Yutaka; Koizumi, Nobuyuki; Hirano, Masami; Araki, Tamio; and Kojima, Koichi, 4,518,023, Cl. 152-361.0FP.

Hirano, Mitsunori: *See*—
Hirano, Tsumoru; Umemoto, Makoto; and Hirano, Mitsunori, 4,518,687, Cl. 430-548.000.

Hirano, Shigeo: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshiro; Hirano, Shigeo; Hirose, Takeshi; and Adachi, Keiichi, 4,518,682, Cl. 430-543.000.

Hirano, Tsumoru; Umemoto, Makoto; and Hirano, Mitsunori, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,518,687, Cl. 430-548.000.

Hirano, Yutaka, to Diesel Kiki Co., Ltd. Trouble detecting apparatus for a sensor in an internal combustion engine system. 4,517,831, Cl. 73-116.000.

Hirao, Hiroshi: *See*—
Suzuki, Yasuo; Hirao, Hiroshi; and Nagasawa, Masanori, 4,518,873, Cl. 307-451.000.

Hirata, Yoshikatsu, to Brother Kogyo Kabushiki Kaisha. Printer with moveable carriage actuating pinch roller to release position. 4,518,271, Cl. 400-636.100.

Hirosawa, Kouichiro: *See*—
Oguma, Tomio; Hirosawa, Kouichiro; and Mitsui, Tsutomu, 4,518,068, Cl. 192-0.052.

Hirose, Koichi: *See*—
Shibata, Akira; Hirose, Koichi; and Yamamoto, Akihiro, 4,519,005, Cl. 360-65.000.

Hirose, Takeshi: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshiro; Hirano, Shigeo; Hirose, Takeshi; and Adachi, Keiichi, 4,518,682, Cl. 430-543.000.

Hista, Jean C., to Framatome et Cie. Reactor building. 4,518,561, Cl. 376-293.000.

Hitachi Cable Limited: *See*—
Kamada, Osao, 4,518,449, Cl. 156-153.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Hashimoto, Hisayoshi; and Tamura, Morio, 4,517,878, Cl. 91-396.000.

Hitachi Engineering Co., Ltd.: *See*—
Takaku, Kazuo; Naruse, Akisuke; Fujimoto, Hirotsugu; and Kimura, Hiroshi, 4,518,560, Cl. 376-245.000.

Hitachi Heating Appliances Co., Ltd.: *See*—
Taguchi, Shunichi; Ohkawa, Shuji; Watanabe, Mitsuru; and Kikuchi, Itsuo, 4,518,839, Cl. 219-10.55B.

Hitachi, Ltd.: *See*—
Adachi, Shigeki, 4,517,797, Cl. 60-39.281.
Atsumi, Akira; Oguni, Kensaku; Kuroda, Shigeaki; Senshu, Takao; and Yoshioka, Kazuo, 4,517,811, Cl. 62-197.000.
Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, 4,518,665, Cl. 429-153.000.
Fukushima, Isao; Kobori, Yasunori; Nishijima, Hideo; and Masuda, Yoshinori, 4,518,901, Cl. 318-328.000.
Funasaki, Ken; Iijima, Toshiki; and Kagohata, Tsuneo, 4,518,032, Cl. 165-12.000.
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Tanaka, Hirotoshi, 4,518,868, Cl. 307-306.000.
Kamohara, Hideaki; Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, 4,518,514, Cl. 252-70.000.
Mizuno, Takao; Uchikawa, Naoshi; Murayama, Akira; and Tamura, Takahiro, 4,518,324, Cl. 417-366.000.
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Shibata, Akira; Hirose, Koichi; and Yamamoto, Akihiro, 4,519,005, Cl. 360-65.000.
Taguchi, Sadanori; Aida, Toshiyuki; Yamamoto, Shigehiko; and Honda, Yukio, 4,518,890, Cl. 313-346.00R.
Takaku, Kazuo; Naruse, Akisuke; Fujimoto, Hirotsugu; and Kimura, Hiroshi, 4,518,560, Cl. 376-245.000.
Toyooka, Takashi; Aoki, Hirokazu; and Sugie, Mamoru, 4,519,049, Cl. 365-12.000.
Ura, Katsumi; Inui, Taiji; and Sakka, Kenji, 4,517,804, Cl. 60-657.000.
Yabiki, Akira; Imanishi, Norio; Shibata, Yoji; Kosuge, Wataru; and Yukawa, Nobumichi, 4,518,989, Cl. 358-86.000.

Hitachi Metals, Ltd.: *See*—
Noguchi, Koji; Asanae, Masumi; and Kimura, Fumio, 4,518,673, Cl. 430-108.000.

Hitachi Shipbuilding & Engineering Co. Ltd.: *See*—
Yamamoto, Masahiko; Nishino, Yoshinori; Komura, Akio; and Ebisu, Tomio, 4,518,556, Cl. 264-295.000.

Hitzman, Donald O., to Phillips Petroleum Company. Oil Treatment. 4,518,489, Cl. 208-223.000.

Hobson, David: *See*—
Gardner, John F.; and Hobson, David, 4,518,149, Cl. 251-144.000.

Hodge, Philo B.: *See*—
Hottenrott, Hans G.; Hodge, Philo B.; and Cochran, Thomas J., 4,518,910, Cl. 324-158.00P.

Hoechst Aktiengesellschaft: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; Rosenthal, Johannes; and Schafer, Stefan, 4,518,538, Cl. 260-543.00P.
Pistorius, Rudolf, 4,518,537, Cl. 260-504.00R.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Kosley, Raymond W., Jr.; and Allen, Richard C., 4,518,713, Cl. 514-326.000.

Hoffend, John C.: *See*—
Davis, James R.; and Hoffend, John C., 4,517,894, Cl. 101-126.000.

Hoffman, Gary R.: *See*—
Cook, William A.; Hoffman, Gary R.; and Pulford, William M., 4,518,958, Cl. 340-679.000.

Hoffmann, Armin: *See*—
Lang, Gusztav; Hoffmann, Armin; and Bisping, Heinz, 4,518,291, Cl. 411-60.000.

Hoffmann, Ernst H.; Arendt, Hans F.; Spiewok, Leonhard; and Rettich, Jakob. Method and apparatus for balancing of out-of-balance forces in centrifuges or combined washing machines-spin driers. 4,517,695, Cl. 8-158.000.

Hoffmann-La Roche Inc.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,518,784, Cl. 549-39.000.

Hoffmann, Peter; and Evers, Walter, to Lang Apparatebau GmbH. Backflow-preventing valve. 4,518,006, Cl. 137-218.000.

Hoffmeister, Jurgen; and Kuhn, Bernhard, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,518,355, Cl. 433-29.000.

Hoganas AB: *See*—
Tengzelius, Jan R.; Blande, Carl-Axel; and Svensson, Lars-Erik, 4,518,427, Cl. 75-251.000.

Hojo, Akimichi: *See*—
Toyoda, Nobuyuki; and Hojo, Akimichi, 4,518,871, Cl. 307-443.000.

Holland, Scott B.; Greene, Edward S.; Kowalski, David A.; and Strachan, Bruce D., to Ford Motor Company. Air suspension system service diagnostics. 4,517,832, Cl. 73-118.000.

Holles Laboratories: *See*—
Holly, Frank J., 4,518,579, Cl. 424-9.000.

Holly, Frank J., to Holles Laboratories. pH stabilized fluorescing ophthalmic composition containing fluorexon. 4,518,579, Cl. 424-9.000.

Holly, Kenneth: *See*—
Smith, Gehrard J.; and Holly, Kenneth, 4,519,034, Cl. 364-200.000.

Holmgren, Per: *See*—
Ransheim, Anders P.; Thomsen, Arne; and Holmgren, Per, 4,517,845, Cl. 73-861.050.

Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-phenoxy-2-pyrimidinyl alkanols. 4,518,600, Cl. 514-256.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Koyanagi, Takahiro; and Sakaoka, Hiromu, 4,517,940, Cl. 123-198.00E.
Ooka, Yuzo, 4,518,070, Cl. 192-85.0CA.
Otaka, Shoichi; Kondo, Yukio; Kumada, Masayuki; Kawamoto, Hideyo; and Miura, Keiji, 4,517,951, Cl. 123-572.000.
Takada, Minoru, 4,518,204, Cl. 301-63.00R.
Yasutake, Kousuke, 4,517,933, Cl. 123-55.0VF.

Honda, Yukio: *See—*
Taguchi, Sadanori; Aida, Toshiyuki; Yamamoto, Shigehiko; and Honda, Yukio, 4,518,890, Cl. 313-346.00R.
Honeywell Inc.: *See—*
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.
Hong, Soon Y. Pollen gathering device. 4,517,694, Cl. 6-4.00R.
Honna, Takaji: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, 4,518,712, Cl. 514-255.000.
Hoover, David S.: *See—*
Schweigharett, Frank; Hoover, David S.; and Garg, Diwaker, 4,518,479, Cl. 208-8.0LE.
Horbal, Mark T.: *See—*
Grzybowski, Bohdan; and Horbal, Mark T., 4,518,308, Cl. 414-735.000.
Hori, Takashi; Ueda, Sanae; and Kojima, Yoshihiro, to Maruzen Oil Co., Ltd. Process for the production of basic alkaline earth metal phenates. 4,518,807, Cl. 568-716.000.
Horikiri, Kenji: *See—*
Ueda, Fumio; Tsuboi, Yoshiaki; Arai, Hirotsugu; Horikiri, Kenji; and Ideno, Hiroaki, 4,518,959, Cl. 340-784.000.
Horio, Masamitsu: *See—*
Matsuda, Morio; and Horio, Masamitsu, 4,518,810, Cl. 568-905.000.
Horizon Co., Ltd.: *See—*
Shimizu, Masaaki; and Aihara, Akira, 4,518,380, Cl. 493-420.000.
Hornberg, Gunnar, to Konstruktions Teknik. Automatic coupling device for loading platforms. 4,518,186, Cl. 294-82.240.
Horst, Paul V., Sr.; and Hoyt, Charles D., to Crockett & Kelly, Inc. Electrically-powered portable space heater. 4,518,847, Cl. 219-365.000.
Hosford, Gregory S.: *See—*
Lane, Lloyd L.; and Hosford, Gregory S., 4,517,855, Cl. 74-528.000.
Hoshi, Yoshikazu: *See—*
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Takano, Yoshiya; and Hoshi, Yoshikazu, 4,517,946, Cl. 123-450.000.
Hoshika, Shuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Angle measuring device with line sensor. 4,518,859, Cl. 250-231.0SE.
Hosoya, Katsumi, to Nissan Motor Company, Limited. Twin ignition plug control system for an internal combustion engine. 4,517,952, Cl. 123-638.000.
Hospital For Sick Children, The: *See—*
Morin, J. Donald, 4,517,747, Cl. 33-178.00B.
Hottenrott, Hans G.; Hodge, Philo B.; and Cochran, Thomas J., to International Business Machines Corporation. Buckling beam twist probe contactor assembly with spring biased stripper plate. 4,518,910, Cl. 324-158.00P.
Houseman, David L.: *See—*
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.
Houston, Richard N.: *See—*
Read, Reginald A.; and Houston, Richard N., 4,518,939, Cl. 335-262.000.
Howard, Webster E., Jr., to International Business Machines Corporation. Resistive mesh structure for electroluminescent cell. 4,518,891, Cl. 313-398.000.
Howell, Edward H.: *See—*
Musick, Donald R.; and Howell, Edward H., 4,517,929, Cl. 123-41.100.
Hoyt, Charles D.: *See—*
Horst, Paul V., Sr.; and Hoyt, Charles D., 4,518,847, Cl. 219-365.000.
Hoyt, Wilber S. Energy conservation system for heating and cooling of structures. 4,517,809, Cl. 62-183.000.
HR Textron Inc.: *See—*
Hsu, William W.; and Runkel, Manfred A., 4,518,004, Cl. 137-116.000.
Hriscisce, Frank T.: *See—*
Cherukuri, Subraman R.; Marschall-Helman, Ellen; and Hriscisce, Frank T., 4,518,615, Cl. 426-4.000.
Hruby, Victor J.; and Mosberg, Henry, to Gibson-Stephens Institute. Conformationally constrained cyclic enkephalin analogs with delta receptor specificity. 4,518,711, Cl. 514-11.000.
Hsia, Samson T.; and Ogasawara, Pam, to Clorox Company, The. Food coating compositions for foods cooked by microwave. 4,518,618, Cl. 426-262.000.
Hsu, William W.; and Runkel, Manfred A., to HR Textron Inc. Multifunction valve. 4,518,004, Cl. 137-116.000.
Huang, Yung-Lung. Torque-adjustable screwdriver. 4,517,865, Cl. 81-475.000.
Huberts, John T.: *See—*
Wiseman, Alan G.; and Huberts, John T., 4,517,850, Cl. 73-864.210.
Huckler, Volker: *See—*
Schafer, Helmut; Huckler, Volker; and Teich, Michael, 4,517,856, Cl. 74-528.000.
Hudson Products Corporation: *See—*
Larinoff, Michael W., 4,518,035, Cl. 165-101.000.
Hug, Nikolaus, to Dupro AG. Suction device for cleaning textile floor coverings. 4,517,705, Cl. 15-351.000.
Hull, Richard W.; and Teslenko, Leonard, to Western Digital Corporation. MOS Phase lock loop synchronization circuit. 4,519,086, Cl. 375-120.000.
Hundebol, Keld O. Method for producing a grinding- or polishing disc and a machine for this purpose. 4,518,452, Cl. 156-211.000.
Hunt, Charles d'A.: *See—*
Fletcher, Archibald W.; and Hunt, Charles d'A., 4,518,418, Cl. 75-10.00R.
Hunter, Arthur C.: *See—*
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Hunter Enterprises Orillia Limited: *See—*
Richmond, Iain J.; Wong, David; Puust, Ants; and Oldham, James A., 4,517,903, Cl. 110-233.000.
Hunter, Kent; and Hunter, Lawrence D. Security fence system. 4,518,953, Cl. 340-564.000.
Hunter, Lawrence D.: *See—*
Hunter, Kent; and Hunter, Lawrence D., 4,518,953, Cl. 340-564.000.
Hurnik, Helmut: *See—*
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Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,743, Cl. 525-80.000.
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,515, Cl. 525-79.000.
Hurst, Peter. Web splicing apparatus. 4,518,127, Cl. 242-58.300.
Huss, Heinrich. Installation for supplying photographic emulsion carriers to a developing machine. 4,518,241, Cl. 354-319.000.
Hutchin, Richard A., to Itek Corporation. Combined shearing interferometer and Hartmann wavefront sensor. 4,518,854, Cl. 250-201.000.
Hydromatik GmbH: *See—*
Schniederjan, Reinhold, 4,518,321, Cl. 417-218.000.
Hylton, Thomas A., to Upjohn Company, The. Processes for the preparation of hydratropic acids. 4,518,799, Cl. 562-423.000.
Iannelli, Frank M.; and James, David H., to Gerlach Industries. Wine dispensing apparatus and method. 4,518,104, Cl. 222-146.600.
Ibis Systems, Inc.: *See—*
Stupak, Joseph J., Jr., 4,518,881, Cl. 310-13.000.
Ichino, Hiroyuki: *See—*
Nishikawa, Kazuo; Ichino, Hiroyuki; and Okura, Keniti, 4,519,063, Cl. 369-172.000.
Ida, Masatoshi: *See—*
Fukuoka, Kenji; Ida, Masatoshi; Goto, Atsuo; Akagi, Toshimasa; Imai, Masaharu; and Kimura, Kenji, 4,518,863, Cl. 250-578.000.
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Mizogami, Shigeyoshi; and Akimoto, Shinichi, 4,518,751, Cl. 526-114.000.
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Igarashi, Hitoshi: *See—*
Shimizu, Shigeaki; Kubo, Yoshimi; Arai, Yoshio; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,517,727, Cl. 29-570.000.
Iida, Seiu; Inokuchi, Tomio; and Munakata, Hiroaki, to Mitsubishi Chemical Industries Limited. Hypoglycemic agents. 4,518,591, Cl. 424-195.100.
Iijima, Toshiki: *See—*
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Iinuma, Hironobu: *See—*
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Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.
Ijames, Gerald A. Furnace structure. 4,518,117, Cl. 237-53.000.
Ikeda, Daishiro: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.
Ikegawa, Akihiko: *See—*
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Illinois Tool Works Inc.: *See—*
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Pleickhardt, George C.; and Swick, E. Grant, 4,518,293, Cl. 411-107.000.
Illium, Herbert C., Jr.: *See—*
Drexler, Leonard H.; Flynn, Richard M.; Fox, George R.; Illium, Herbert C., Jr.; and O'Connor, Robert J., 4,518,830, Cl. 179-103.000.
Imada, Akira; Harada, Setsuo; and Asai, Mitsuko, to Takeda Chemical Industries, Ltd. Antibiotics C-19393S_2 . 4,518,529, Cl. 260-245.20T.
Image Graphics, Incorporated: *See—*
Tarnowski, Andrew A.; and Anderson, Brian G., 4,518,898, Cl. 315-371.000.

Imai, Eiichi: *See*—
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Imai, Masaharu: *See*—
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Lehmann, Franz, 4,518,155, Cl. 269-60.000.
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, to Teijin Limited; and Fuji Electric Co., Ltd. Device for transmitting measurement data from a rotating body. 4,518,962, Cl. 340-870.280.
Imperial Chemical Industries Limited: *See*—
Stansfield, James F.; Toole, James; and Topham, Arthur, 4,518,435, Cl. 106-308.00N.
Imperial Chemical Industries PLC: *See*—
Brody, Harry, 4,518,744, Cl. 525-184.000.
Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, 4,518,415, Cl. 71-92.000.
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Makishima, Takao; Inaba, Shigeru; and Wada, Yasuyoshi, 4,518,099, Cl. 221-30.000.
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INCO Selective Surfaces Limited: *See*—
Mason, John J.; Cunningham, Michael T.; and Crosby, Jeffrey N., 4,518,467, Cl. 204-37.100.
Indy Lighting, Inc.: *See*—
Miles, Earl F., Jr., 4,518,896, Cl. 315-162.000.
Infrasonik AB: *See*—
Olsson, Mats A.; and Sandstrom, Roland, 4,517,915, Cl. 116-137.00R.
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Gastaldo, Giancarlo, 4,518,730, Cl. 524-114.000.
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Knapp, Gunter, 4,518,302, Cl. 414-273.000.
Inokuchi, Tomio: *See*—
Iida, Seiu; Inokuchi, Tomio; and Munakata, Hiroaki, 4,518,591, Cl. 424-195.100.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,518,317, Cl. 417-45.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Fluid pumping system. 4,518,317, Cl. 417-45.000.
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, to Nippondenso Co., Ltd. Ignition timing control for internal combustion engines. 4,517,944, Cl. 123-425.000.
Institut National de la Recherche Agronomique: *See*—
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Intel Corporation: *See*—
Folmsbee, Alan C., 4,519,050, Cl. 365-53.000.
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Fermaglich, Saul, 4,518,503, Cl. 210-662.000.
International Business Machines Corporation: *See*—
Davis, James W.; and Jones, Frank D., 4,518,874, Cl. 307-467.000.
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Gini, Donald; and Stockton, Dean B., 4,518,634, Cl. 427-128.000.
Hottenrott, Hans G.; Hodge, Philo B.; and Cochran, Thomas J., 4,518,910, Cl. 324-158.00P.
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Miller, William R.; and Prasad, Chandrika, 4,518,112, Cl. 228-124.000.
International Coal Refining Company: *See*—
Schweigharett, Frank; Hoover, David S.; and Garg, Diwaker, 4,518,479, Cl. 208-8.0LE.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,517,990, Cl. 131-276.000.
Boden, Richard M., 4,517,991, Cl. 131-276.000.
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International Harvester Company: *See*—
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International Jensen Incorporated: *See*—
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International Minerals & Chemical Corp.: *See*—
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International Remote Imaging Systems, Inc.: *See*—
Deindoerfer, Fred H., 4,519,087, Cl. 377-10.000.
International Shoe Machine Corporation: *See*—
Vornberger, Walter, 4,517,697, Cl. 12-10.500.
International Standard Electric Corporation: *See*—
Black, Philip W.; and Irven, John, 4,518,407, Cl. 65-3.120.
Lambrechts, Eric G. Y.; Verhoeven, Herman K. M.; and Claes, Constant J. P., 4,518,160, Cl. 271-214.000.
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International Telephone and Telegraph Corporation: *See*—
Biswas, Dipak R.; and Nath, Dilip K., 4,518,628, Cl. 427-55.000.
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Inui, Osamu: *See*—
Yano, Takeshi; Fukui, Izumu; Hamatsuki, Takeshige; Sato, Eiichi; and Inui, Osamu, 4,518,887, Cl. 310-328.000.
Inui, Taiji: *See*—
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Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; and Inui, Toshiharu, 4,518,645, Cl. 428-212.000.
Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Image reader with a light diffuser. 4,518,864, Cl. 250-578.000.
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Irie, Namio: *See*—
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Irven, John: *See*—
Black, Philip W.; and Irven, John, 4,518,407, Cl. 65-3.120.
Irving, Edward, to Ciba Geigy Corporation. Photopolymerizable compositions containing diaryliodosyl salts. 4,518,676, Cl. 430-280.000.
Isayama, Takuro, to Ricoh Company, Ltd. Ink jet air removal system. 4,518,974, Cl. 346-140.00R.
Ishida, Hiroshi: *See*—
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Ishida, Tsuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Detecting device for detecting a magnetic strip embedded in a sheet. 4,518,919, Cl. 324-228.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,517,818, Cl. 68-5.00E.
Ishigami, Kazuhiro; Furuhashi, Shoji; and Yuzawa, Haruo, to Nissan Motor Company, Limited. Engine vibration transmission structure. 4,517,945, Cl. 123-425.000.
Ishiguro, Tomihiro: *See*—
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Ishihara, Atsushi: *See*—
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Ishii, Satoshi, to Pioneer Electronic Corporation. Power supply circuit for amplifier. 4,518,928, Cl. 330-297.000.
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Ishikawa, Masao; Kobayashi, Kazuhiro; Kimura, Toshihiko; and Higuchi, Moeko, to Konishiroku Photo Industry Co., Ltd. Bleach-fixing solution and processing of light-sensitive color photographic material by use thereof. 4,518,680, Cl. 430-393.000.
Ishikawa, Shigeru, to Muro Kinzoku Kogyo Co., Ltd. Successive screw feeder driver. 4,517,863, Cl. 81-434.000.
Ishikawa, Tatsuo: *See*—
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Ishikawa, Yasuhiro; Yamada, Kazuhiro; and Kida, Masashi, to Yokohama Rubber Co., Ltd., The. Rubber compositions comprising (1) polyisoprene (2) cobalt salt of rosin (3) carbon black and (4) sulphur. 4,518,733, Cl. 524-274.000.
Ishikura, Shinichi: *See*—
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Ishizuka, Hiroshi. High temperature high pressure apparatus. 4,518,334, Cl. 425-77.000.
Isobe, Toshiaki: *See*—
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Isomura, Shigenori: *See*—
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Itek Corporation: *See*—
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Ito, Kazuhiko: *See*—
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Ito, Kenji: *See*—
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Ito, Kunio: *See*—
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Ito, Teruyoshi: *See*—
Matsui, Takeaki; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, 4,519,038, Cl. 364-431.030.
Ito, Toshimitsu; and Isobe, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Air fuel ratio control method. 4,517,949, Cl. 123-489.000.

Ito, Yo: *See*—
Shibuya, Kiyoshi; Kan, Takahiro; and Ito, Yo, 4,518,029, Cl. 164-463.000.
ITT Industries, Inc.: *See*—
Backes, Reiner, 4,518,872, Cl. 307-448.000.
Backes, Reiner, 4,518,951, Cl. 340-365.00S.
Drake, Cyril F.; Maries, Alan; and Bateson, Paul F., 4,518,429, Cl. 106-14.390.
Ityel, Amos: *See*—
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Iwasaki, Tomonobu, to Fujitsu Limited. Misoperation prevention circuit. 4,518,865, Cl. 307-200.00A.
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Iwatsu Electric Co., Ltd.: *See*—
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J. D. Hanger & Company Limited: *See*—
May, Denis R. W.; and Hiddleston, James N., 4,517,688, Cl. 3-2.000.
J.M. Voith GmbH: *See*—
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Jaccaud, Michel: *See*—
Perrot, Michel; and Jaccaud, Michel, 4,518,569, Cl. 423-19.000.
Jackson, Frank W. Endoscopic scrub device. 4,517,702, Cl. 15-114.000.
Jackson Laboratory, The: *See*—
Coleman, Douglas L.; and Applezweig, Norman, 4,518,595, Cl. 514-178.000.
Jackson, Philip, to E. Beaudrey & Cie. Cleaning device for industrial water intakes. 4,518,494, Cl. 210-158.000.
Jackson, Rodney P., to H.E.M.E. International Limited. Measuring probes. 4,518,913, Cl. 324-127.000.
Jackson, Thomas N.: *See*—
Freeouf, John L.; and Jackson, Thomas N., 4,518,846, Cl. 219-271.000.
Jacobine, Anthony F., to Upjohn Company, The. Compositions and process. 4,518,473, Cl. 204-159.180.
Jacobs, Marcellus L.; and Jacobs, Paul R., to Jacobs Wind Electric. Dual fold tail vane assembly for wind energy systems. 4,518,312, Cl. 416-13.000.
Jacobs, Paul R.: *See*—
Jacobs, Marcellus L.; and Jacobs, Paul R., 4,518,312, Cl. 416-13.000.
Jacobs Wind Electric: *See*—
Jacobs, Marcellus L.; and Jacobs, Paul R., 4,518,312, Cl. 416-13.000.
Jacobson, Allan J.: *See*—
Johnson, Jack W.; and Jacobson, Allan J., 4,518,534, Cl. 260-429.00R.
Jacobson, Vivian R. Swimming instruction device. 4,518,364, Cl. 441-129.000.
Jacquinot, Bernard: *See*—
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Jahn, Paul F., to Advanced Ceramic Systems, Inc. Boron nitride paint for ceramic hot pressing. 4,518,736, Cl. 524-404.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Apparatus for the manufacture of a blank for a container. 4,518,340, Cl. 425-393.000.
Jalowsky, Lewis, to Joy Insignia, Inc. Embroidered design for securement to an article and method of making the same. 4,517,910, Cl. 112-439.000.
James, David H.: *See*—
Iannelli, Frank M.; and James, David H., 4,518,104, Cl. 222-146.600.
James River-Norwalk, Inc.: *See*—
Wecker, Sheldon M., 4,518,557, Cl. 264-45.900.
Jamison, Terry, to Garrett Corporation, The. Turbocharger compressor valve. 4,517,803, Cl. 60-611.000.
Jandrich, Henry C. Wine fermentation apparatus. 4,517,884, Cl. 99-276.000.
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Jansma, John C., to Standard Oil Company, The. Concurrent production of two grades of coke using a single fractionator. 4,518,486, Cl. 208-131.000.
Janssen, Daniel J. G.: *See*—
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Jargosch, Reiner E.: *See*—
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Jeneric Industries, Inc.: *See*—
Prasad, Arun, 4,518,564, Cl. 420-464.000.
Jennmar Corporation: *See*—
Calandra, Frank, Jr., 4,518,292, Cl. 411-82.000.
Jensen, Niels D.; Nielsen, Kurt F.; and Larden, Bent, to Grundfos A/S. Pumping sets. 4,518,318, Cl. 417-53.000.
Jensen, Ole R., to E. R. Squibb & Sons. Ostomy pouch with reduced friction insert. 4,518,388, Cl. 604-332.000.
Jensen, Paul L.: *See*—
Mueller, Edward E.; and Jensen, Paul L., 4,518,350, Cl. 432-13.000.
Jensen, Ronald N.; and Walker, John A. Wind blade vibration eliminator for helicopters. 4,518,313, Cl. 416-18.000.
Jestin, Yvon: *See*—
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,518,811, Cl. 568-943.000.
Jeuch, Pierre, to Commissariat a l'Energie Atomique. Process for positioning an electrical contact hole between two interconnection lines of an integrated circuit. 4,518,629, Cl. 427-89.000.
Jeumont-Schneider Corporation: *See*—
Wiart, Albert, 4,518,908, Cl. 318-723.000.
Jewer, Alan A., to News Log International, Inc. Method for formatting optically encoded digital data on a substrate and the data record carrier formed thereby. 4,519,054, Cl. 369-30.000.
Johnson, Gregory L., to Shell Oil Company. Non-fouling oil atomization tip. 4,518,120, Cl. 239-424.000.
Johnson, Jack W.; and Jacobson, Allan J., to Exxon Research & Engineering Co. Layered vanadium compounds containing phosphorus or arsenic and pendant organic groups. 4,518,534, Cl. 260-429.00R.
Johnson, Keith, Jr., to AMP Incorporated. Cable clamping and orienting apparatus. 4,517,718, Cl. 29-33.00M.
Johnson, Oscar; and Luecke, Robert A., to Dow Chemical Company, The. Process for the manufacture of synthetic paper and the product thereof. 4,518,681, Cl. 430-532.000.
Johnson, Roger A.: *See*—
West, Harold H.; Johnson, Roger A.; and Clark, Charles W., Jr., 4,518,153, Cl. 254-274.000.
Johnson, Wallace R.; and Beem, W. Wayne, to Outboard Marine Corporation. Operation control for electric outboard motor. 4,518,362, Cl. 440-6.000.
Johnston, David B. R., to Merck & Co., Inc. 2-Amino-3-cyano-5-halo-6-(substituted)pyrazine. 4,518,599, Cl. 514-255.000.
Johnston, George C.; and Swieboda, Michael A., to International Jensen Incorporated. Loudspeaker diaphragm and method for making same. 4,518,642, Cl. 428-172.000.
Jones, Clyde B. Hydrofoil control. 4,517,912, Cl. 114-275.000.
Jones, Frank D.: *See*—
Davis, James W.; and Jones, Frank D., 4,518,874, Cl. 307-467.000.
Jones, Thomas E., to United States of America, Navy. Metallized synthetic cable. 4,518,632, Cl. 427-118.000.
Jones, Thomas M.: *See*—
Bachman, Brett L.; Baxter, Ward, II; Gruner, Ronald H.; Houseman, David L.; Jones, Thomas M.; Redfield, Stephen R.; Drew, Louis E.; and Druke, Michael B., 4,519,030, Cl. 364-200.000.
Josef Gartner & Co.: *See*—
Gartner, Karl, 4,518,033, Cl. 165-53.000.
Joubert, Daniel: *See*—
Godard, Gerard; Joubert, Daniel; and Gagnaire, Philippe, 4,518,516, Cl. 252-91.000.
Jow, Long J.: *See*—
Jow, Long S.; and Jow, Long J., 4,518,067, Cl. 192-0.090.
Jow, Long S.; and Jow, Long J., to Transtech Industrial Corporation. Automobile brake device. 4,518,067, Cl. 192-0.090.
Joy Insignia, Inc.: *See*—
Jalowsky, Lewis, 4,517,910, Cl. 112-439.000.
Joyner, Robert G.: *See*—
Hennon, Erin D.; and Joyner, Robert G., 4,518,017, Cl. 138-96.00R.
Judkins, Ren S., to Verosol USA Inc. Sun blind construction. 4,518,025, Cl. 160-84.00R.
Jujo Paper Co., Ltd.: *See*—
Fujimura, Fumio; Satake, Toshimi; Iwaguro, Makoto; and Minami, Toshiaki, 4,518,977, Cl. 346-209.000.
Juvin, Pierre; and Moreau, Pierre, to S.E.R.T.O.G. Insecticide composition for use in the form of a shampoo. 4,518,593, Cl. 424-195.000.
K-D Tools, Inc.: *See*—
Taggart, Kenneth J.; and Traub, Kevin W., 4,517,821, Cl. 73-1.00C.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Miyake, Toshio; Yoshida, Mikihiko; and Takeuchi, Kano , 4,518,581, Cl. 424-48.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Kawaguchi, Hatsuo, 4,519,075, Cl. 371-15.000.
Minamida, Kazukiyo; and Asai, Yoshiharu, 4,519,042, Cl. 364-567.000.
Kabushiki Kaisha Kanemitsu: *See*—
Kanemitsu, Yukio, 4,518,374, Cl. 474-170.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kamei, Futoshi, 4,518,027, Cl. 164-435.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Karakama, Tadao; and Uehara, Kazuo, 4,517,800, Cl. 60-337.000.
Shinsen, Mitsuhisa, 4,518,369, Cl. 464-101.000.
Yamanishi, Akio; and Sato, Kanichi, 4,518,031, Cl. 164-526.000.
Kabushiki Kaisha Murayama Seisakusho: *See*—
Nemoto, Kiyoshi, 4,518,328, Cl. 417-511.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Yasukawa, Kazuyoshi, 4,518,298, Cl. 414-4.000.
Kabushiki Kaisha Shinsei Industries: *See*—
Fujita, Mituo, 4,518,454, Cl. 156-541.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Shionozaki, Yoshio, 4,518,226, Cl. 350-350.00R.
Kabushiki Kaisha Takai-Pika-Denki-Seisakusho: *See*—
Yamada, Makoto; Kubota, Tatsushi; and Kojima, Ikuzo, 4,518,173, Cl. 280-806.000.
Kabushiki Kaisha Toshiba: *See*—
Takahashi, Hideaki; Shoji, Tetsuo; Saitoh, Kiyoshi; Muramatsu, Masamitsu; and Kimura, Kazushige, 4,518,464, Cl. 204-1.00T.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kawabata, Yasuhiro; Kadokawa, Yoshio; Mori, Nobuyuki; and Suzuki, Shinji, 4,517,854, Cl. 74-492.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Yasuhiro; Kadokawa, Yoshio; Mori, Nobuyuki; and Suzuki, Shinji, 4,517,854, Cl. 74-492.000.
Kadokawa, Yoshio: *See*—
Kawabata, Yasuhiro; Kadokawa, Yoshio; Mori, Nobuyuki; and Suzuki, Shinji, 4,517,854, Cl. 74-492.000.
Kageyama, Katsuaki; and Adachi, Yasuhi, to Toray Silicone Company, Ltd. Heat fixer roll with an evaporated metal surface. 4,518,244, Cl. 355-3.0FU.
Kagohata, Tsuneo: *See*—
Funasaki, Ken; Iijima, Toshiki; and Kagohata, Tsuneo, 4,518,032, Cl. 165-12.000.
Kahan, Agostne, to Medimpex Gyogyszerkuelkereskedelmi Vaallalat. Watersoluble derivatives of non-steroidal anti-inflammatory agents and a process for the production thereof. 4,518,608, Cl. 514-420.000.
Kaji, Yasumasa; Isomura, Shigenori; Harada, Takashi; and Sakakibara, Shuji, to Nippondenso Co., Ltd. Method and apparatus for controlling air-fuel ratio in internal combustion engines. 4,517,948, Cl. 123-489.000.
Kakei, Tsutomu: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,518,466, Cl. 204-28.000.
Kakiuchi, Hazime: *See*—
Mashimo, Satoshi; Kakiuchi, Hazime; and Nakajima, Masayoshi, 4,518,376, Cl. 474-261.000.
Kalkbrenner, Ralph W.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,518,843, Cl. 219-121.0LC.
Kals, Walter, to Niagara Blower Company. Vacuum producing condenser. 4,517,805, Cl. 60-688.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Hoffmeister, Jurgen; and Kuhn, Bernhard, 4,518,355, Cl. 433-29.000.
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi Magnievoi I Elektrodnoi Promyshlennosti; and Leningradsky Tekhnologichesky Institut Imeni Lensoveta. Process for desilication of aluminate liquors in the production of alumina. 4,518,571, Cl. 423-119.000.
Kamada, Osao, to Hitachi Cable Limited. Process for production of hydrate surfaced rolled copper foil laminated plates. 4,518,449, Cl. 156-153.000.
Kamei, Futoshi, to Kabushiki Kaisha Kobe Seiko Sho. Mold adapted to house electromagnetic stirrer coil for continuous casting equipment. 4,518,027, Cl. 164-435.000.
Kamohara, Hideaki; Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, to Hitachi, Ltd. Heat storage material. 4,518,514, Cl. 252-70.000.
Kan, Takahiro: *See*—
Shibuya, Kiyoshi; Kan, Takahiro; and Ito, Yo, 4,518,029, Cl. 164-463.000.
Kanai, Tetsuro, to NEC Corporation. Method of A/D conversion by successive approximations. 4,518,949, Cl. 340-347.0AD.
Kanamori, Hideo, to Idemitsu Kosan Company Limited. Water-containing lubricant. 4,518,512, Cl. 252-49.500.
Kane, James; and Murr, John, Jr., to RCA Corporation. CRT with internal neck coating of crystalline tin oxide for suppressing arcing therein. 4,518,893, Cl. 313-479.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,518,726, Cl. 524-32.000.
Muramatsu, Eiichi; Matsumoto, Shigemi; and Nagoshi, Fumiya, 4,518,742, Cl. 525-67.000.
Kaneko, Tadashi: *See*—
Nishikawa, Toshio; Kaneko, Tadashi; and Othuka, Kazutoshi, 4,517,947, Cl. 123-489.000.
Kanekubo, Minoru. Liquid branch flow guide conduit assembly for use in a magnetic apparatus for separating foreign matters from waste liquids containing the foreign matters. 4,518,496, Cl. 210-222.000.
Kanemitsu, Yukio, to Kabushiki Kaisha Kanemitsu. Poly-V pulleys. 4,518,374, Cl. 474-170.000.
Kaneyuki, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Charging generator having waterproof cover. 4,518,886, Cl. 310-71.000.
Kao Corporation: *See*—
Matsuda, Morio; and Horio, Masamitsu, 4,518,810, Cl. 568-905.000.
Kaplan, Alan, to Emkay Manufacturing Co. Crystal plating chamber apparatus. 4,517,918, Cl. 118-723.000.
Kaplan, Steven E.; and Frink, Richard C., to Atlantic Richfield Company. Process for the preparation of polyhydroxybutadienes. 4,518,770, Cl. 528-487.000.
Karakama, Tadao; and Uehara, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic control system for off-highway self-propelled work machines. 4,517,800, Cl. 60-337.000.
Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl; Lautenschlager, Horst; and Lautenschlager, Gerhard, 4,517,706, Cl. 16-238.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Wilkens, Christian, 4,518,640, Cl. 428-102.000.
Kasamatsu, Kiyoshi; and Konishi, Hiroyuki, to Sumitomo Chemical Company, Limited. Use of trifluoromethanesulfonanilides. 4,518,594, Cl. 514-155.000.
Kashiwaya, Mineo: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Kataoka, Mutsuo, to Toray Industries, Inc. Stripper for radiosensitive resist. 4,518,675, Cl. 430-256.000.
Katayama Chemical Works Co., Ltd.: *See*—
Umekawa, Osamu; and Katayama, Sakae, 4,518,610, Cl. 514-516.000.
Katayama, Sakae: *See*—
Umekawa, Osamu; and Katayama, Sakae, 4,518,610, Cl. 514-516.000.
Kato, Kazuo; Hamada, Fumio; and Ito, Kenji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,518,683, Cl. 430-546.000.
Kato, Mikihiko; Komine, Shigeo; Kawamata, Toshio; Morita, Kazuhiko; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Process for preparing magnetic recording medium. 4,518,626, Cl. 427-48.000.
Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Metallic base paint. 4,518,726, Cl. 524-32.000.
Kaufman, Benjamin J.: *See*—
Sung, Rodney L.; Kaufman, Benjamin J.; and Dorn, Peter, 4,518,782, Cl. 548-353.000.
Kaufman, Ernest D.; and Dexter, Robin W., to American Cyanamid Company. Delivery of polymeric antiprecipitants in oil wells employing an oil soluble carrier system. 4,518,511, Cl. 252-8.55B.
Kawabata, Yasuhiro; Kadokawa, Yoshio; Mori, Nobuyuki; and Suzuki, Shinji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Low-vibration steering device. 4,517,854, Cl. 74-492.000.
Kawaberi, Seiji: *See*—
Okada, Hisao; Tanaka, Seiichiro; and Kawaberi, Seiji, 4,518,993, Cl. 358-114.000.
Kawachi, Hideo: *See*—
Higashihara, Teruaki; Nonaka, Chiaki; Yoshida, Tadao; and Kawachi, Hideo, 4,519,057, Cl. 369-50.000.
Kawada, Shigeki; and Ishida, Hiroshi, to Fujitsu Fanuc Limited. System for detecting rotational speed. 4,518,916, Cl. 324-173.000.
Kawagoe, Nobukazu: *See*—
Yuasa, Yoshio; and Kawagoe, Nobukazu, 4,518,250, Cl. 355-69.000.
Kawaguchi, Hatsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Device for checking the printing circuit of a thermal printer. 4,519,075, Cl. 371-15.000.
Kawaguchi, Hiroshi: *See*—
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,518,589, Cl. 514-27.000.
Kawaguchi, Masafumi: *See*—
Banno, Takashi; Seki, Tadashi; Kawaguchi, Masafumi; Tanaka, Yukio; Iwasaki, Morikatsu; and Nagasawa, Toshio, 4,518,353, Cl. 432-205.000.
Kawahara, Yoshihiro; and Hayashi, Kiyoshi, to Mita Industrial Company Limited. Electrostatic recording apparatus. 4,518,975, Cl. 346-153.100.
Kawai, Hisasi: *See*—
Morino, Seiji; and Kawai, Hisasi, 4,518,882, Cl. 310-15.000.
Kawai, Motoshi: *See*—
Matsui, Takeski; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, 4,519,038, Cl. 364-431.030.
Kawakami, Kouichi; and Tanaka, Mamoru, to Nippin Seiko Kabushiki Kaisha. Carriage apparatus. 4,517,852, Cl. 74-89.150.
Kawamata, Toshio: *See*—
Kato, Mikihiko; Komine, Shigeo; Kawamata, Toshio; Morita, Kazuhiko; and Sato, Tsunehiko, 4,518,626, Cl. 427-48.000.
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Otaka, Shoichi; Kondo, Yukio; Kumada, Masayuki; Kawamoto, Hideyo; and Miura, Keiji, 4,517,951, Cl. 123-572.000.
Kawasaki, Hiroshi: *See*—
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,518,354, Cl. 430-527.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakano, Hideaki; Ozu, Tadahiro; and Shirai, Eiichi, 4,517,930, Cl. 123-41.310.
Kawasaki Steel Corporation: *See*—
Shibuya, Kiyoshi; Kan, Takahiro; and Ito, Yo, 4,518,029, Cl. 164-463.000.
Kazuoka, Koji: *See*—
Suganuma, Tetsuya; and Kazuoka, Koji, 4,518,563, Cl. 419-29.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Kluting, Bernd; and Zaveri, Vikram H., 4,518,190, Cl. 296-65.00R.
Kellogg, Michael S., to Pfizer Inc. 6-β-Substituted penicillanic acids as β-lactamase inhibitors. 4,518,530, Cl. 260-245.20R.
Kelly, Gilbert H., deceased: *See*—
Bedenbender, John W.; and Kelly, Gilbert H., deceased, 4,519,053, Cl. 367-190.000.

Kelso, Robert G.: *See*—
Markusch, Peter H.; Kelso, Robert G.; and Schmitt, Peter D., 4,518,522, Cl. 252-188.310.
Keltz, Douglas; and Heaton, Robert, to Empire Abrasive Equipment Corporation. Valve for regulating the pressurized flow of abrasives, in particular blast media. 4,518,145, Cl. 251-5.000.
Kempel, John J.: *See*—
Otto, Ronald F.; and Kempel, John J., 4,518,026, Cl. 160-232.000.
Kendall Company, The: *See*—
Perlin, Alfred R., 4,517,984, Cl. 128-642.000.
Kent, David P., to Control Process, Inc. Take-away technique for sliced bulk products. 4,518,300, Cl. 414-46.000.
Kerey, Gyorgy: *See*—
Takacs, Istvan; Kerey, Gyorgy; Illes, Janos; Rudolf, Peter; Gere, Pal; Czebe, Laszlo ; and Neszmelyi, Erzsebet, 4,518,771, Cl. 536-21.000.
Kerfeld, Donald J.: *See*—
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Keryluk, Walter B.: *See*—
Whittlesey, Curtis C.; Henriksen, Gary L.; Keryluk, Walter B.; and Wolff, Merle T., 4,518,664, Cl. 429-38.000.
Kerzner, Mark G., to Dresser Industries, Inc. Method for determining formation dip. 4,517,835, Cl. 73-152.000.
Kesling, Haven S., Jr., to Atlantic Richfield Company. Production of aryl alkyl ethers from methylbenzyl alcohol using bis-(dithiobenzyl)-nickel(II) catalyst. 4,518,806, Cl. 568-659.000.
Kessler, Bayard F., to Novation, Inc. Modem cartridge and connection for program cartridge type computers. 4,518,823, Cl. 179-2.0DP.
Kessler, Lawrence W.; and Yuhas, Donald E., to Sonoscan, Inc. Acoustic imaging system and method. 4,518,992, Cl. 358-112.000.
Kewpie Kabushiki Kaisha: *See*—
Hasegawa, Mineo, 4,518,695, Cl. 435-206.000.
Key Systems, Inc.: *See*—
Palmer, Tom, 4,517,923, Cl. 119-51.00R.
Khan, Mahboob; and Trieu, Tom, to Fairchild Camera & Instrument Corporation. Double polysilicon process for fabricating CMOS integrated circuits. 4,517,731, Cl. 29-571.000.
Khanna, Pyare L.; and Colvin, Floyd W., to Syntex (U.S.A.) Inc. Reduction in non-specific interference in hydrophobic ligand assays. 4,518,701, Cl. 436-500.000.
Kholm, Gunnar B.: *See*—
Kiisler, Karl R.; Sjuld, Tiiya-Maya F.; Kristyanson, Peep G.; Kholm, Gunnar B.; Rokk, Juri K.; and Post, Kalju M., 4,518,453, Cl. 156-307.500.
Kida, Katsuaki: *See*—
Kuwajima, Teruaki; Kida, Katsuaki; and Ishikura, Shinichi, 4,518.724, Cl. 523-501.000.
Kida, Makoto: *See*—
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Kiekert GmbH & Co. Kommanditgesellschaft: *See*—
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Kiesvaara, Martti: *See*—
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Kiisler, Karl R.; Sjuld, Tiiya-Maya F.; Kristyanson, Peep G.; Kholm, Gunnar B.; Rokk, Juri K.; and Post, Kalju M. Method of processing the outside surfaces of a ski. 4,518,453, Cl. 156-307.500.
Kikuchi, Itsuo: *See*—
Taguchi, Shunichi; Ohkawa, Shuji; Watanabe, Mitsuru; and Kikuchi, Itsuo, 4,518,839, Cl. 219-10.55B.
Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto, to Takeda Chemical Industries, Ltd. Plasmid and production thereof. 4,518,698, Cl. 435-317.000.
Kim, Chong S.: *See*—
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Kimble, Kenneth B.: *See*—
Bresson, Clarence R.; and Kimble, Kenneth B., 4,518,492, Cl. 209-166.000.
Kimoto, Katsumi; and Ishihara, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical disk apparatus. 4,519,056, Cl. 369-43.000.
Kimura, Fumio: *See*—
Noguchi, Koji; Asanae, Masumi; and Kimura, Fumio, 4,518,673, Cl. 430-108.000.
Kimura, Hiroshi: *See*—
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Kimura, Kiyoshi: *See*—
Tarumi, Noriyoshi; Okamoto, Yukio; Kimura, Kiyoshi; Fukuchi, Masakazu; Miwa, Tadashi; and Ito, Kunio, 4,518,976, Cl. 346-153.100.
Kimura, Masami: *See*—
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Kimura, Tetsuo: *See*—
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Kimura, Toshihiko: *See*—
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Kinde, Ronald: *See*—
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King, Donald R.: *See*—
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King, Leonard H.: *See*—
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Steer, Peter L.; and Edwards, John V., 4,518,389, Cl. 604-339.000.
Kingston, James E. Aerifying device for whirlpool bath or tub. 4,518,325, Cl. 417-368.000.
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Kirby, James R.; and Looney, Donald F. Buried conductor cable energy distribution system with conductor loop enclosure. 4,518,817, Cl. 174-38.000.
Kirchbrucher, Rudiger: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; and Pohlmann, Klaus D., 4,518,284, Cl. 405-296.000.
Kirkham, Robert L.; and Forrest, Garland F., Jr. Automatic truck bed cover assembly. 4,518,194, Cl. 296-100.000.
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Sugimori, Masahiro, to Mitsubishi Rayon Company Ltd. Delustering coating composition excellent in abrasion resistance. 4,518,472, Cl. 204-159.150.
Kiss, Pal: *See*—
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.
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Frichmann, Albert; Sternisa, Danilo; Mermi, Kurt; and Kistner, Herbert, 4,518,290, Cl. 411-30.000.
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Kitagawa, Junji; and Akita, Shigeyuki, to Nippon Soken, Inc. Electric liquid level detector. 4,518,956, Cl. 340-620.000.
Kitaguchi, Tadashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.
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Forster, Heinz; Klauke, Erich; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,518,416, Cl. 71-94.000.
Klausing, Karl-Heinz: *See*—
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Klecka, Miro E., to Shell Oil Company. Sulfur separation process. 4,518,577, Cl. 423-573.00R.
Kleefeldt, Frank; and Raetz, Rolf, to Kiekert GmbH & Co. Kommanditgesellschaft. Automobile power door latch. 4,518,180, Cl. 292-201.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,518,311, Cl. 415-102.000.
Kleinschmit, Einhard: *See*—
Scheurenbrand, Dieter; Stotz, Manfred; Distel, Manfred; and Kleinschmit, Einhard, 4,518,091, Cl. 220-5.00A.
Klimsch/Optronics, Inc.: *See*—
Warner, Andrew; and Zlotek, David A., 4,518,920, Cl. 328-14.000.
Warner, Andrew, 4,518,998, Cl. 358-208.000.
Klinner, Wilfred E.; and Knight, Andrew C., to National Research Development Corporation. Crop comminuting apparatus having vibrating cutting blades. 4,518,124, Cl. 241-101.700.
Kloppe, Herbert: *See*—
Stutenkemper, Paul; Rest, Heinz; and Kloppe, Herbert, 4,518,138, Cl. 248-73.000.
Kluting, Bernd; and Zaveri, Vikram H., to Keiper Automobiltechnik GmbH & Co. KG. Hinge unit for a seat, particularly a power vehicle seat. 4,518,190, Cl. 296-65.00R.

Knapp, Gunter, to Ing. G. Knapp Ges.mgH & Co. KG. System and process for automatic stacking, storage and withdrawal of packaged merchandise in large warehouses. 4,518,302, Cl. 414-273.000.

Kneubuhl, Beat, to Schweizerische Eidgenossenschaft, Vertreten Durch Die Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustungsdienste. Small arms projectile. 4,517,897, Cl. 102-439.000.

Knifton, Joan F., to Texaco Inc. Process for producing ethylene glycol using a ruthenium-copper catalyst. 4,518,715, Cl. 518-700.000.

Knight, Andrew C.: *See*—
Klinner, Wilfred E.; and Knight, Andrew C., 4,518,124, Cl. 241-101.700.

Knudsen, Ronald D.; and Reiter, Stephen E., to Phillips Petroleum Company. Ethylene oligomeration. 4,518,814, Cl. 585-523.000.

Kobari, Yuji: *See*—
Yagi, Eiji; Kobari, Yuji; and Takahashi, Sadahiro, 4,518,055, Cl. 180-142.000.

Kobayashi, Hidetoshi; Takahashi, Toshiro; Hirano, Shigeo; Hirose, Takeshi; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,518,682, Cl. 430-543.000.

Kobayashi, Hiroshi, to Nissan Motor Company, Limited. Liquid quantity sensor of capacitor type and method of producing same. 4,519,012, Cl. 361-284.000.

Kobayashi, Hisamine; Ishiguro, Tomihiro; and Murata, Akio, to Shikishima Tipton Manufacturing Co., Ltd. Elongated annular vibratory barrel finishing apparatus having unbalanced weights controlled by an electronic processor. 4,517,771, Cl. 51-163.200.

Kobayashi, Kazuhiro: *See*—
Ishikawa, Masao; Kobayashi, Kazuhiro; Kimura, Toshihiko; and Higuchi, Moeko, 4,518,680, Cl. 430-393.000.

Kobayashi, Kazuo: *See*—
Yoshida, Hisayoshi; Ogawa, Ichitaro; Hagio, Tsuyoshi; Kobayashi, Kazuo; and Yamamoto, Takayoshi, 4,518,702, Cl. 501-90.000.

Kobayashi, Masakazu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Kobayashi, Robert J.; Nancarrow, James H.; and Alger, Jeffrey L., to Garrett Corporation, The. Turbocharger combustor method. 4,517,802, Cl. 60-606.000.

Kobayashi, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile. 4,518,056, Cl. 180-193.000.

Kobayashi, Takeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter speed setting device for camera. 4,518,243, Cl. 354-418.000.

Kobayashi, Yoshikazu: *See*—
Takagi, Toshihiko; Kobayashi, Yoshikazu; Suzuki, Yoshiji; and Hara, Tsutomu, 4,519,064, Cl. 369-275.000.

Kobe Steel, Limited: *See*—
Tanaka, Kazuo; Motonaga, Kenjiro; and Tanaka, Kozo, 4,518,123, Cl. 241-18.000.

Kober, Leo: *See*—
Forster, Alfred; Geyer, Willi; and Kober, Leo, 4,518,196, Cl. 296-204.000.

Kobori, Yasunori: *See*—
Fukushima, Isao; Kobori, Yasunori; Nishijima, Hideo; and Masuda, Yoshinori, 4,518,901, Cl. 318-328.000.

Kobuck, Richard M.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,518,843, Cl. 219-121.0LC.

Koch, Gerhard, to Hafele KG. Connecting device for detachably maintaining flat structures perpendicular to each other. 4,518,278, Cl. 403-230.000.

Koch, Robert W., to Amchem Products, Inc. Cold paint stripping composition. 4,518,518, Cl. 252-142.000.

Kocherga, Stepan I.: *See*—
Rusakova, Svetlana V.; Glyzin, Vladimir I.; Kocherga, Stepan I.; Ananieva, Alla A.; and Libizova, Larisa F., 4,518,592, Cl. 424-195.100.

Kochi, Hiromu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Kodali, Satyanarayana; Singh, Bhim S.; Whittlesey, Curtis C.; and Henriksen, Gary L., to Energy Development Associates, Inc. Electrolyte circulation subsystem. 4,518,663, Cl. 429-18.000.

Kodman, Ronald W. Removable lid and pour spout. 4,518,094, Cl. 220-254.000.

Kohl, Horst: *See*—
Kuckens, Alexander; and Kohl, Horst, 4,518,105, Cl. 222-207.000.

Kohler, Gernot: *See*—
Naarmann, Herbert; Muench, Volker; Kohler, Gernot; and Simak, Petr, 4,518,535, Cl. 260-438.100.

Koike, Keiichi: *See*—
Kamohara, Hideaki; Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, 4,518,514, Cl. 252-70.000.

Koike, Norio: *See*—
Tamatani, Masaaki; Tsuda, Nobuyuki; Koike, Norio; and Ajiro, Sakae, 4,518,985, Cl. 358-60.000.

Koizumi, Nobuyuki: *See*—
Yamaguchi, Yutaka; Koizumi, Nobuyuki; Hirano, Masami; Araki, Tamio; and Kojima, Koichi, 4,518,023, Cl. 152-361.0FP.

Kojima, Ikuzo: *See*—
Yamada, Makoto; Kubota, Tatsushi; and Kojima, Ikuzo, 4,518,173, Cl. 280-806.000.

Kojima, Koichi: *See*—
Yamaguchi, Yutaka; Koizumi, Nobuyuki; Hirano, Masami; Araki, Tamio; and Kojima, Koichi, 4,518,023, Cl. 152-361.0FP.

Kojima, Yoshihiro: *See*—
Hori, Takashi; Ueda, Sanae; and Kojima, Yoshihiro, 4,518,807, Cl. 568-716.000.

Kokaji, Norio; and Kinoshita, Kunio, to Iwatsu Electric Co., Ltd. Method for forming a latent image and apparatus for carrying out the same. 4,518,970, Cl. 346-74.200.

Koke, Eric J. Hair brush with cleaning feature. 4,517,703, Cl. 15-246.000.

Kolc, Jaroslav F.: *See*—
Swerdloff, Michael D.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,518,413, Cl. 71-28.000.

Komatsu Zenoah Co.: *See*—
Kiyooka, Katsumi, 4,517,939, Cl. 123-198.00E.

Kominami, Naoya: *See*—
Tsuda, Nobuaki; Kominami, Naoya; Inagaki, Kenji; and Imamiya, Tamotsu, 4,518,497, Cl. 210-259.000.

Komine, Shigeo: *See*—
Kato, Mikihiko; Komine, Shigeo; Kawamata, Toshio; Morita, Kazuhiko; and Sato, Tsunehiko, 4,518,626, Cl. 427-48.000.

Komine, Toshiaki: *See*—
Fukuoka, Yoshitaka; and Komine, Toshiaki, 4,517,738, Cl. 29-840.000.

Komonytsky, Donald, to Storage Technology Corporation. LSI self-test method. 4,519,078, Cl. 371-25.000.

Komura, Akio: *See*—
Yamamoto, Masahiko; Nishino, Yoshinori; Komura, Akio; and Ebisu, Tomio, 4,518,556, Cl. 264-295.000.

Konak, A. Riza: *See*—
Lim, Git B.; and Konak, A. Riza, 4,518,505, Cl. 210-712.000.

Kondo, Shinichi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.

Kondo, Yukio: *See*—
Otaka, Shoichi; Kondo, Yukio; Kumada, Masayuki; Kawamoto, Hideyo; and Miura, Keiji, 4,517,951, Cl. 123-572.000.

Kondoleon, Anthony: *See*—
Consales, Emanuel J.; and Kondoleon, Anthony, 4,517,744, Cl. 33-169.00C.

Kone Oy: *See*—
Makinen, Heimo; and Suur-Askola, Seppo, 4,518,062, Cl. 187-29.00R.

Konishi, Hiroyuki: *See*—
Kasamatsu, Kiyoshi; and Konishi, Hiroyuki, 4,518,594, Cl. 514-155.000.

Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, to Bristol-Myers Company. BBM-2478 Antibiotic complex. 4,518,589, Cl. 514-27.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ishikawa, Masao; Kobayashi, Kazuhiro; Kimura, Toshihiko; and Higuchi, Moeko, 4,518,680, Cl. 430-393.000.
Kato, Kazuo; Hamada, Fumio; and Ito, Kenji, 4,518,683, Cl. 430-546.000.
Matsuzaki, Masatoshi; Yamazaki, Toshinori; and Nomori, Hiroyuki, 4,518,670, Cl. 430-58.000.
Sasaki, Masao; and Onodera, Kaoru, 4,518,686, Cl. 430-512.000.
Tarumi, Noriyoshi; Okamoto, Yukio; Kimura, Kiyoshi; Fukuchi, Masakazu; Miwa, Tadashi; and Ito, Kunio, 4,518,976, Cl. 346-153.100.
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,518,674, Cl. 430-108.000.

Konstruktions Teknik: *See*—
Hornberg, Gunnar, 4,518,186, Cl. 294-82.240.

Koomey, Inc.: *See*—
Allewitz, Murry, 4,518,005, Cl. 137-207.000.

Kopp, Hubert, to Breitfeld & Schliekert GmbH. Machine for manufacturing a template for edge grinding a spectacle lens. 4,517,870, Cl. 83-411.00R.

Koppe, Rudolf P.; and Blom, Hendrik, to U.S. Philips Corporation. Signal processing system comprising a signal source, a signal processing unit and connecting cables. 4,518,927, Cl. 330-284.000.

Korbonits, Dezso: *See*—
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.

Korneev, Valentin I.: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.

Korte, Kevin R.; and Snyder, Daniel D., to Brown & Williamson Tobacco Corporation. Tobacco conditioning apparatus. 4,517,992, Cl. 131-304.000.

Korzonas, Raymond, to Chicago Bridge & Iron Company. Apparatus for separating ice from a slurry and washing the ice. 4,517,806 Cl. 62-123.000.

Kosley, Raymond W., Jr.; and Allen, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. Analgesic substituted-1-aminoalkylamino-4-aryloxypiperidines. 4,518,713, Cl. 514-326.000.

Kostin, Ivan M.: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.

Kosuge, Wataru: *See*—
Yabiki, Akira; Imanishi, Norio; Shibata, Yoji; Kosuge, Wataru; and Yukawa, Nobumichi, 4,518,989, Cl. 358-86.000.

Kotera, Nobuo: *See*—
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Tanaka, Hirotoshi, 4,518,868, Cl. 307-306.000.

Kovnat, Larry A.: *See*—
Frey, Thomas M.; and Kovnat, Larry A., 4,519,000, Cl. 358-301.000.

Kowalski, David A.: *See*—
Holland, Scott B.; Greene, Edward S.; Kowalski, David A.; and Strachan, Bruce D., 4,517,832, Cl. 73-118.000.

Koyanagi, Takahiro; and Sakaoka, Hiromu, to Honda Giken Kogyo Kabushiki Kaisha. Intake device for internal combustion engine. 4,517,940, Cl. 123-198.00E.

Kramer, George M.; Weissman, Walter; Brown, Herbert C.; and Pettit, Rowland, deceased (by Pettit, Flora H., executrix), to Exxon Research & Engineering Co. Preparing esters and carboxylic acids from lower olefins. 4,518,798, Cl. 560-233.000.

Krappitz, Heinz; Carstensen, Hans-Peter; and Weinhold, Friedrich, to B.A.T. Cigaretten-Fabriken GmbH. Pneumatic sealing arrangement. 4,517,829, Cl. 73-49.800.

Kratochvil, David F.: *See*—
Tantillo, Donnie J.; Kratochvil, David F.; Moore, Robert G.; and Browne, Edward M., 4,519,052, Cl. 367-79.000.

Kraus, Mark G.: *See*—
Oates, Robert M.; Petronio, Carlo F.; and Kraus, Mark G., 4,518,917, Cl. 324-207.000.

Kraus, Willibald, to TRW Inc. Molded plastic socket with easy-on hard-off stud engager. 4,518,297, Cl. 411-437.000.

Krause, Arthur A.: *See*—
Lim, Walter K.; and Krause, Arthur A., 4,518,103, Cl. 222-135.000.

Kreager, William D., to Frito-Lay, Inc. Method and apparatus for sealing bags. 4,517,787, Cl. 53-450.000.

Kreager, William D., to Frito-Lay, Inc. Apparatus and method for ultrasonic sealing of packages. 4,517,790, Cl. 53-552.000.

Krebs, Jay; and Freeburg, Thomas A., to Motorola, Inc. Method and apparatus for communicating variable length messages between a primary station and remote stations of a data communications system. 4,519,068, Cl. 370-82.000.

Krempl, Peter W.; Schindler, Wolfgang; and Faschingleitner, Leopold, to List, Hans. Method for the continuous measurement of the mass of aerosol particles in gaseous samples and a device for the implementation of the method. 4,518,861, Cl. 250-339.000.

Krishnamurthy, Sowmithri; Landolt, George R.; and Schoennagel, Hans J., to Mobil Oil Corporation. Pretreatment of a fresh iridium-containing catalyst. 4,518,708, Cl. 502-230.000.

Kristiansen, Odd; and Drabek, Jozef, to Ciba Geigy Corporation. 2-(3-Pyridyl)-1,3,4-oxadiazoles and use thereof in pest control. 4,518,601, Cl. 514-340.000.

Kristyanson, Peep G.: *See*—
Kiisler, Karl R.; Sjuld, Tiiya-Maya F.; Kristyanson, Peep G.; Kholm, Gunnar B.; Rokk, Juri K.; and Post, Kalju M., 4,518,453, Cl. 156-307.500.

Kroner, Klaus, to U.S. Philips Corporation. Integrable transistor oscillator requiring only one pin to quartz resonator. 4,518,933, Cl. 331-108.00D.

Krueger, Ulf A.; and Meshako, Thomas M., to Ciba Geigy Corporation. Process for making epoxy novolac resins with high epoxy values. 4,518,762, Cl. 528-95.000.

Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Rotary valve arrangement. 4,517,938, Cl. 123-190.00E.

Kruger, Wolfgang, to Motoren- und Turbinen-Union Munchen GmbH. Arrangement for connecting a ceramic rotor wheel, particularly a turbine rotor wheel of a turbomachine, such as a gas turbine engine, to a metallic shaft. 4,518,315, Cl. 416-241.00B.

Krupp-Koppers GmbH: *See*—
Gelfand, Jan, 4,518,461, Cl. 202-270.000.

Kubo, Yoshimi: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Arai, Yoshio; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,517,727, Cl. 29-570.000.

Kubota, Nobunori: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,517,794, Cl. 57-304.000.

Kubota, Tatsushi: *See*—
Yamada, Makoto; Kubota, Tatsushi; and Kojima, Ikuzo, 4,518,173, Cl. 280-806.000.

Kuckens, Alexander; and Kohl, Horst, to DAGMA Deutsche Automaten-und Getrankemaschinen GmbH & Co., Ltd. Method of and device for dispensing viscous concentrates of variable viscosity in accurately metered quantities of variable volume. 4,518,105, Cl. 222-207.000.

Kuhlmann, Gerhard; and Wolf, Erwin, to Robert Bosch GmbH. Saw table for a compass saw. 4,517,869, Cl. 83-100.000.

Kuhn, Bernhard: *See*—
Hoffmeister, Jurgen; and Kuhn, Bernhard, 4,518,355, Cl. 433-29.000.

Kukes, Simon G.: *See*—
Mann, David P.; Kukes, Simon G.; and Coombs, Daniel M., 4,518,484, Cl. 208-87.000.

Kumada, Masayuki: *See*—
Otaka, Shoichi; Kondo, Yukio; Kumada, Masayuki; Kawamoto, Hideyo; and Miura, Keiji, 4,517,951, Cl. 123-572.000.

Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, to Fuji Xerox Co., Ltd. Picture image position setting apparatus. 4,518,999, Cl. 358-285.000.

Kurata, Masami: *See*—
Saitoh, Hiroyuki; and Kurata, Masami, 4,518,987, Cl. 358-75.000.
Saitoh, Hiroyuki; and Kurata, Masami, 4,518,988, Cl. 358-75.000.

Kuri, Takeshi: *See*—
Tanaka, Motomu; Osuka, Masanari; Kuri, Takeshi; and Takakuwa, Sadao, 4,518,764, Cl. 528-271.000.

Kurihara, Teruo; and Oowa, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotary anode X-ray tube. 4,519,093, Cl. 378-132.000.

Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; and Matsuura, Kazuo, to Nippon Oil Co., Ltd. Process for polyolefins production. 4,518,752, Cl. 526-116.000.

Kuroda, Shigeaki: *See*—
Atsumi, Akira; Oguni, Kensaku; Kuroda, Shigeaki; Senshu, Takao; and Yoshioka, Kazuo, 4,517,811, Cl. 62-197.000.

Kuroki, Junsuke; Irie, Naznio; and Tanaka, Haruto, to Nissan Motor Company, Limited. Automatic vehicle height-adjusting system. 4,518.169, Cl. 280-6.00R.

Kushi, Kenji: *See*—
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Sugimori, Masahiro, 4,518,472, Cl. 204-159.150.

Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., to Automation Industries, Inc. Reinforced formed hose. 4,518,018, Cl. 138-130.000.

Kuu, Wei-Youh, to Research Corporation. Immobilized biocatalysts. 4,518,693, Cl. 435-178.000.

Kuwajima, Teruaki; Kida, Katsuaki; and Ishikura, Shinichi, to Nippon Paint Co., Ltd. Aqueous coating composition. 4,518,724, Cl. 523-501.000.

Kyle, James C. Terminal assembly for heart pacemakers. 4,518,820, Cl. 174-152.0GM.

Kyoto Ceramic Kabushiki Kaisha: *See*—
Okabayashi, Yoshikatsu; Nakamura, Noboru; Matsumoto, Takeshi; and Osumi, Yoshimasa, 4,518,704, Cl. 502-80.000.

La Jolla Cancer Research Foundation: *See*—
Ruoslahti, Erkki I.; and Pierschbacher, Michael D., 4,517,686, Cl. 3-1.000.

Lacombe, Gerard A.; and Bonicalzi, Leopold. Insulated wall unit construction. 4,517,780, Cl. 52-233.000.

LaFleur, Arthur E., to Custom Packaging Systems, Inc. Collapsible bag and discharge valve therefor. 4,518,106, Cl. 222-460.000.

La Forge, David H.; and Portner, Peer M., to Novacor Medical Corporation. Solenoid activated closure device. 4,519,043, Cl. 364-571.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Foulard, Jean; Rimbert, Jean F.; Vernet, Gilles; and Goursat, Albert-Gilbert, 4,518,421, Cl. 75-49.000.

Lamboley, Jean J., to Thomson-CSF. Self-adapting process and device for triggering a triac. 4,518,867, Cl. 307-252.00B.

Lambrechts, Eric G. Y.; Verhoeven, Herman K. M.; and Claes, Constant J. P., to International Standard Electric Corporation. Flat article stacking and tray loading apparatus. 4,518,160, Cl. 271-214.000.

Lamere, Jean-Claude. Method and apparatus for reproducing at least one colored surface. 4,518,234, Cl. 354-20.000.

Lamp'l, Thomas A.; and Eby, Randall W. Cargo handling ramp. 4,517,698, Cl. 14-72.500.

Landolt, George R.: *See*—
Krishnamurthy, Sowmithri; Landolt, George R.; and Schoennagel, Hans J., 4,518,708, Cl. 502-230.000.

Lane, Lloyd L.; and Hosford, Gregory S., to Deere & Company. Power take-off lever arrangement for a tractor. 4,517,855, Cl. 74-528.000.

Lang Apparatebau GmbH: *See*—
Hoffmann, Peter; and Evers, Walter, 4,518,006, Cl. 137-218.000.

Lang, Gusztav; Hoffmann, Armin; and Bisping, Heinz, to Hilti Aktiengesellschaft. Plastics material expansion dowel with wave-form slots. 4,518,291, Cl. 411-60.000.

Lang, Gusztav: *See*—
Gebauer, Ludwig; Irmscher, Hans-Jurgen; Lang, Gusztav; and Mauthe, Peter, 4,518,283, Cl. 405-260.000.

Langer, Arthur W.: *See*—
Schulz, Donald N.; Kitano, Kissho; Burkhardt, Terry J.; and Langer, Arthur W., 4,518,757, Cl. 526-329.000.

Langille, Donald S.: *See*—
Penterson, Craig A.; and Langille, Donald S., 4,517,904, Cl. 110-264.000.

Langner, Carl; Poran, Michael; and Szarka, Geza, to Concast Incorporated. Arrangement and a method for transferring products in metal processing installations. 4,518,074, Cl. 198-425.000.

Langseth, Rollin E., to AT&T Bell Laboratories. Matched filter for combating multipath fading. 4,519,084, Cl. 375-14.000.

Lanier Business Products, Inc.: *See*—
Bolick, Fred C., Jr., 4,519,009, Cl. 360-92.000.

LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Stephen S., to Mobil Oil Corporation. Hydrotreating/isomerization process to produce low pour point distillate fuels and lubricating oil stocks. 4,518,485, Cl. 208-89.000.

Larden, Bent: *See—*
Jensen, Niels D.; Nielsen, Kurt F.; and Larden, Bent, 4,518,318, Cl. 417-53.000.

Larinoff, Michael W., to Hudson Products Corporation. Air-cooled, vacuum steam condenser. 4,518,035, Cl. 165-101.000.

Larizza, Pietro, to Larizza & Scuratti s.d.f. Instrument for writing and drawing with pivotable cover. 4,518,273, Cl. 401-98.000.

Larizza & Scuratti s.d.f.: *See—*
Larizza, Pietro, 4,518,273, Cl. 401-98.000.

Larsson, Ingemar. Apparatus for handling sheets for microfilming or other similar recording. 4,518,251, Cl. 355-75.000.

Larsson, Peter: *See—*
Andersson, Arne; and Larsson, Peter, 4,518,265, Cl. 366-318.000.

Larsson, Peter L.; and Clabburn, Robin J. T., to Raychem Corporation. Clamp assembly for power cables. 4,518,819, Cl. 174-78.000.

Laruelle, Claude; Lepant, Marcel; and Raynier, Bernard, to S.A. Panmedica. Dipeptides of L-5-hydroxytryptophan, processes for their preparation and drugs in which they are present. 4,518,587, Cl. 514-19.000.

Latreille, Maurice G.; and Tennant, William A., to American Can Company. Methods and apparatus for maintaining a pressure contact seal between nozzles and cavities of an on-line injection molding machine. 4,518,344, Cl. 425-570.000.

Laurel Bank Machine Co., Ltd.: *See—*
Goi, Kowichi, 4,518,158, Cl. 271-9.000.

Lautenschlager, Gerhard: *See—*
Lautenschlager, Karl; Lautenschlager, Horst; and Lautenschlager, Gerhard, 4,517,706, Cl. 16-238.000.

Lautenschlager, Horst: *See—*
Lautenschlager, Karl; Lautenschlager, Horst; and Lautenschlager, Gerhard, 4,517,706, Cl. 16-238.000.

Lautenschlager, Karl; Lautenschlager, Horst; and Lautenschlager, Gerhard, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Adjustable cabinet hinge having a biased catch. 4,517,706, Cl. 16-238.000.

La Velle, Carl A.: *See—*
Vicic, John C.; La Velle, Carl A.; and Parris, Joe P., III, 4,518,144, Cl. 251-1.00A.

Lazarus, John H. Pressure compensating water flow control devices. 4,518,013, Cl. 137-811.000.

Leahy, John: *See—*
Foley, James; Habbal, Fawwaz; and Leahy, John, 4,518,627, Cl. 427-48.000.

Lear Siegler, Inc.: *See—*
Gabriele, Leonard A., 4,518,289, Cl. 409-244.000.

LeBlanc, Beth A.: *See—*
Eichbauer, George N.; and LeBlanc, Beth A., 4,518,654, Cl. 428-331.000.

LeBlanc, J. T. Apparatus and process for placement of prefabricated structures. 4,517,781, Cl. 52-299.000.

LeBlond Makino Machine Tool Co.: *See—*
Bazuin, Johannes, 4,517,866, Cl. 82-39.000.

Lebrun, Jean: *See—*
Cousin, Maurice; Pipon, Yves; Droulon, Georges; and Lebrun, Jean, 4,518,182, Cl. 292-201.000.

Lee, Chi-Long; and Rabe, James A., to Dow Corning Corporation. Foamable organosiloxane compositions. 4,518,716, Cl. 521-82.000.

Lee, Joseph K. Extendible safety impact bags for vehicles. 4,518,183, Cl. 293-118.000.

Lee, Thomas B.: *See—*
Bantick, John R.; Fuher, John; Hardern, David N.; and Lee, Thomas B., 4,518,612, Cl. 514-457.000.

Leesona Corporation: *See—*
Marshall, Bryce G., 4,518,126, Cl. 242-18.00R.

Lefebvre, Herve M.; and Helderle, Paul M., to Compagnie Francaise des Petroles. Device for controlling a safety valve disposed below an activation pump in a hydrocarbon production well. 4,518,036, Cl. 166-105.000.

Leger, Joachim. Material and component testing machine. 4,517,843, Cl. 73-847.000.

Lehman, Richard F., to Xerox Corporation. Mechanism and method for controlling the temperature and output of a fluorescent lamp. 4,518,895, Cl. 315-117.000.

Lehmann, Franz, to Imea SA. Fixing device of workpieces for wire spark erosion machines. 4,518,155, Cl. 269-60.000.

Leibowitz, Alec. Gemstone polishing machine. 4,517,770, Cl. 51-125.500.

Leitheiser, Melvin A.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Articles containing non-fused aluminum oxide-based abrasive mineral. 4,518,397, Cl. 51-293.000.

Leland F. Blatt: *See—*
Blatt, Leland F.; and Crorey, David J., 4,518,187, Cl. 294-88.000.

Leloux, Arnoldus W. J., to Wavin B.V. Method of and device for making perforations in a tubular web of plastics foil. 4,517,868, Cl. 83-54.000.

Lemartret, Odile: *See—*
Allais, Andre ; Clemence, Francois; Deraedt, Roger; and Lemartret, Odile, 4,518,775, Cl. 544-92.000.

Lenaerts, George V.; Charchanko, Eugene W.; and Dambenieks, Andrejs, to Northern Telecom Limited. Method for making circuit boards with die stamped contact pads and conductive ink circuit patterns. 4,517,739, Cl. 29-846.000.

Leningradsky Tekhnologichesky Institut Imeni Lensoveta: *See—*
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.

Lennartz, Rudiger; Rott, Willi; and Sindorf, Heinz, to Boll & Kirch, Filterbau GmbH, Firma. Flush-back filter. 4,518,501, Cl. 210-411.000.

Le Ny, Jacques; and Val, Christian, to Thomson-CSF. Encapsulating case able to resist high external pressures. 4,518,818, Cl. 174-52.0FP.

Leonberger, Frederick J.; Melngailis, Ivars; Bozler, Carl O.; and McClelland, Robert W., to Massachusetts Institute of Technology. Optical guided wave devices employing semiconductor-insulator structures. 4,518,219, Cl. 350-96.120.

Lepant, Marcel: *See—*
Laruelle, Claude; Lepant, Marcel; and Raynier, Bernard, 4,518,587, Cl. 514-19.000.

Leppard, David G.; and Rody, Jean, to Ciba-Geigy AG. Color-photographic recording material. 4,518,679, Cl. 430-372.000.

Leppard, David G.; and Rody, Jean, to Ciba-Geigy AG. Color-photographic recording material. 4,518,688, Cl. 430-551.000.

Lesley, Gary M., to Head Lites Corporation. Retro-reflective attachment for wearing apparel. 4,517,685, Cl. 2-170.000.

Lester, Theodore V., to Motorola, Inc. Self-oscillating inverter including a DC to DC converter and method for control thereof. 4,519,023, Cl. 363-56.000.

Leutgob, Alois: *See—*
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; and Mullner, Paul, 4,518,417, Cl. 75-10.00R.

LeVasseur, Rodney J.: *See—*
Gabel, Edward R.; Puumala, Edward J.; and LeVasseur, Rodney J., 4,518,853, Cl. 235-449.000.

Levchenko, Alec; and Booth, Michael R., to Febopal Limited. Air extract method and apparatus. 4,517,883, Cl. 98-115.300.

Leverette, Edward H. Dental floss applicator. 4,518,000, Cl. 132-92.00A.

Levin, Ed. Method and setting for mounting ornamental beads and gems. 4,517,817, Cl. 63-26.000.

Levin, Paul D.; and Harding, John D. Blood sampling instrument. 4,517,978, Cl. 128-314.000.

Leviton Manufacturing Company, Inc.: *See—*
Doyle, Richard C.; and Rivera, Lester, 4,518,945, Cl. 340-310.00A.

Levitt, Tod S.: *See—*
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.

Lewarchik, Ronald J.: *See—*
Sekmakas, Kazys; Shah, Raj; Lewarchik, Ronald J.; and Murray, Kevin P., 4,518,746, Cl. 525-443.000.

Lewis, Frederick M.; and Berken, George A., to Zimpro Inc. Method and apparatus for controlling auxiliary fuel addition to a pyrolysis furnace. 4,517,906, Cl. 110-346.000.

Lewis, Robert E., to American Seating Company. Contour seat module. 4,518,199, Cl. 297-248.000.

Lewis, Terry W.; Anderson, Roger J.; and Kerfeld, Donald J., to Minnesota Mining and Manufacturing Company. Metallized information carrying discs. 4,519,065, Cl. 369-275.000.

Lewis, Timothy: *See—*
Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, 4,518,415, Cl. 71-92.000.

Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, to Societe Chimique de la Grande Paroisse - Azote et Products Chimiques. Reactor for nitration of hydrocarbons in the gaseous phase under pressure. 4,518,811, Cl. 568-943.000.

Libizova, Larisa F.: *See—*
Rusakova, Svetlana V.; Glyzin, Vladimir I.; Kocherga, Stepan I.; Ananieva, Alla A.; and Libizova, Larisa F., 4,518,592, Cl. 424-195.100.

Licentia Patent-Verwaltungs-GmbH: *See—*
Scholz, Gerhard, 4,519,003, Cl. 358-335.000.

LiDonnici, Kenneth; and Dituri, Angelo, to General Audio-Visual Inc. Automatic lamp changer for modular slide projector. 4,518,233, Cl. 353-87.000.

Liebig, William J.; and Cummings, Dennis, to Meadox Medicals, Inc. Synthetic woven double-velour graft. 4,517,687, Cl. 3-1.400.

Lim, Git B.; and Konak, A. Riza, to Exxon Production Research Co. Thermal softening process. 4,518,505, Cl. 210-712.000.

Lim, Walter K.; and Krause, Arthur A. Method and apparatus for releasing additional ingredients in a pressurized container. 4,518,103, Cl. 222-135.000.

Lin, Jiing S. Plug-in type of power supply. 4,519,015, Cl. 361-399.000.

Lin, Leo S.: *See—*
Mark, David F.; Lin, Leo S.; and Lu, Shi-Da Y., 4,518,584, Cl. 424-85.000.

Lin, Peter T., to RCA Corporation. Method and apparatus for trimming and finishing the outer edge of a molded record. 4,518,551, Cl. 264-107.000.

Lind, Jeannine H. Pet amusement device. 4,517,922, Cl. 119-29.000.

Lindmayer, Istvan; and Grunwald, Raymond M., to Preci-Tech Ltd. Disposable syringe for needleless injector. 4,518,385, Cl. 604-68.000.

Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Moulding compositions of vinyl chloride polymers, certain copolymers and polymeric plasticisers having a high resistance to ageing. 4,518,743, Cl. 525-80.000.

Lindner, Christian: *See—*
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,515, Cl. 525-79.000.

Lipp, Herbert; and Reckeweg, Horst, to Rheinmetall GmbH. Testing and/or practice projectile for an artillery weapon. 4,517,900, Cl. 102-529.000.

List, Hans: *See—*
Krempl, Peter W.; Schindler, Wolfgang; and Faschingleitner, Leopold, 4,518,861, Cl. 250-339.000.
Listemann, Peter; and Monch, Sigurd, to Hilti Aktiengesellschaft. Copper solder containing cobalt. 4,518,662, Cl. 428-675.000.
Little, William D. Variable magnification stage light. 4,519,020, Cl. 362-268.000.
Lo, Young S.; and Taylor, Chandler R., Jr., to A. H. Robins Company, Inc. [2-[(Nitropyridinyl)amino]phenyl]arylmethanones in a process for preparing pyrido[1,4]benzodiazepines. 4,518,603, Cl. 514-352.000.
Locatelli, Jean L.; and Rollet, Bernard, to Rhone-Poulenc Industries. Imido copolymers. 4,518,754, Cl. 526-262.000.
Locatelli, Jean L.; and Rollet, Bernard, to Rhone-Poulenc Industries. Imido copolymers. 4,518,755, Cl. 526-262.000.
Lochner, Kaspar; Schurmann, Helmut; and Brand, Erich, to Schiedel GmbH & Co. Pasty damping medium method for preparing and using same. 4,518,513, Cl. 252-62.000.
Lockheed Corporation: *See—*
Morrison, Robert A., 4,518,210, Cl. 339-17.0LM.
Loconsolo, Mauro: *See—*
Govoni, Gabriele; Corazzari, Canzio; Di Stefano, Giovanni; and Loconsolo, Mauro, 4,518,750, Cl. 526-68.000.
Loeb, Marvin P.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,517,970, Cl. 128-131.000.
Logan, Shawn M., to AT&T Bell Laboratories. Track and hold circuit. 4,518,921, Cl. 328-151.000.
Long, Don W.: *See—*
Barton, Jerry M.; Long, Don W.; and Lotts, Kenneth D., 4,518,780, Cl. 546-167.000.
Long, John V.; and Gagliani, John. Low density, modified polyimide foams and methods of making same. 4,518,717, Cl. 521-109.100.
Longenecker, Kenneth G.; and Geary, Thomas B., to Westinghouse Electric Corp. Assembly-heat sink for semiconductor devices. 4,518,983, Cl. 357-81.000.
Lonza, Ltd.: *See—*
Tschan, Rene , 4,517,723, Cl. 29-235.000.
Looney, Donald F.: *See—*
Kirby, James R.; and Looney, Donald F., 4,518,817, Cl. 174-38.000.
Lopez, Claudio: *See—*
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Loth, Eric: *See—*
Gogniat, Paul; and Loth, Eric, 4,518,093, Cl. 220-82.00R.
Lott, Peter F.; and Jargosch, Reiner E. Acid based variable viscosity compositions such as corrosion and grease removers and polishes. 4,518,519, Cl. 252-148.000.
Lotts, Kenneth D.: *See—*
Barton, Jerry M.; Long, Don W.; and Lotts, Kenneth D., 4,518,780, Cl. 546-167.000.
Lough, Wendell J.; and Bishop, Donald E., to Weber Technical Products, Division of Craig Systems Corporation. Clean room with replaceable filter and a seal cutting mechanism. 4,518,405, Cl. 55-385.00A.
LTV Aerospace and Defense Company: *See—*
Musgrove, Robert G., 4,518,170, Cl. 280-96.000.
Lu, Shi-Da Y.: *See—*
Mark, David F.; Lin, Leo S.; and Lu, Shi-Da Y., 4,518,584, Cl. 424-85.000.
Luceri, Thomas J.; and Molee, Kenneth J., to Personal Products Company. Embossed panty liner. 4,518,451, Cl. 156-202.000.
Lucia, Joseph T.: *See—*
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.
Luecke, James R., to Harris Corporation. Decision-directed, automatic frequency control technique for non-coherently demodulated M-ARY frequency shift keying. 4,518,922, Cl. 329-50.000.
Luecke, Robert A.: *See—*
Johnson, Oscar; and Luecke, Robert A., 4,518,681, Cl. 430-532.000.
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; and Mullner, Paul, to Voest-Alpine Aktiengesellschaft. Method of, and arrangement for, reducing oxide-containing fine-particle ores. 4,518,417, Cl. 75-10.00R.
Lugscheider, Walter; Riegler, Ernst; and Zajicek, Ernst, to SKW Trostberg Aktiengesellschaft; and Voest-Alpine Aktiengesellschaft. Method of carrying out metallurgical or chemical processes in a shaft furnace, and a low shaft furnace therefor. 4,518,419, Cl. 75-11.000.
Luke, Douglas V., to Smiths Industries Public Limited Company. Tire pressure sensing systems. 4,517,834, Cl. 73-146.500.
LVC Industries, Inc.: *See—*
Paranicas, Peter C., 4,518,834, Cl. 200-16.00D.
Lyle, W. D., Jr.; and Gournay, Luke S., to Mobil Oil Corporation. Method for determining oil saturation in a subsurface formation. 4,517,836, Cl. 73-152.000.
Lyles, Mark B. Filters for polynuclear aromatic hydrocarbon-containing smoke. 4,517,995, Cl. 131-334.000.
Lysenko, George P.: *See—*
Tindall, Gary W.; Lysenko, George P.; Vize, Richard J.; Kiefer, Edward H.; and Smith, Richard J., 4,518,195, Cl. 296-148.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Dorn, Alfred, 4,518,862, Cl. 250-561.000.
Machine Technology, Inc.: *See—*
Devico, Michael J.; and Hillman, Gary, 4,517,752, Cl. 34-58.000.
Mackenzie, Harold B.; and Anderson, Ingvar G., to New Life Foundation. High efficiency refuse-derived-fuel supplying system for industrial boilers. 4,517,925, Cl. 122-2.000.
Mackinnon, John W. M.: *See—*
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; Carey, Linda; and Blatcher, Philip, 4,518,598, Cl. 514-212.000.
MacLeod, Nigel; and Ruxton, David, to Rodime plc. Stepper motor control for data disk system. 4,518,904, Cl. 318-685.000.
Maddox, Jim, Jr.; and Schievelbein, Vernon H., to Texaco Inc. Method of extracting and reutilizing surfactants from emulsions using sulfonated alkyl benzenes and ethoxylated phenols. 4,518,038, Cl. 166-266.000.
Maeda, Mitsuo: *See—*
Nakahori, Ichiro; Nakayama, Shigeki; Maeda, Mitsuo; Yamauchi, Shiro; and Ozawa, Junichiro, 4,517,849, Cl. 73-863.310.
Maekawa, Yukio: *See—*
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,518,354, Cl. 430-527.000.
Magar, Surendar; and Gass, Wanda K., to Texas Instruments Incorporated. Microcomputer with accumulator saturation upon overflow. 4,519,031, Cl. 364-200.000.
Magnavox Government and Industrial Electronics Co.: *See—*
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Magnetic Controls Company: *See—*
Bradley, James D.; and Amundson, Gregg B., 4,519,016, Cl. 361-415.000.
Skovran, Daniel G.; Shockley, Brett A.; and Chouanard, Harvey J., 4,519,014, Cl. 361-397.000.
Makinen, Heimo; and Suur-Askola, Seppo, to Elevator GmbH; and Kone Oy. Procedure and measuring circuit for stopping an elevator. 4,518,062, Cl. 187-29.00R.
Makishima, Takao; Inaba, Shigeru; and Wada, Yasuyoshi, to Sunstar Kabushiki Kaisha. Portable toothpick case. 4,518,099, Cl. 221-30.000.
Makrotalo Oy: *See—*
Miettinen, Jorma K.; and Virtanen, Eero J., 4,518,550, Cl. 264-46.500.
Malak, Stephen P., to Spring-Mornne, Inc. Method and apparatus for statically aligning shafts and monitoring shaft alignment. 4,518,855, Cl. 250-201.000.
Malametz, Arnold: *See—*
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., 4,517,841, Cl. 73-517.0AV.
Maliszewicz, Marc: *See—*
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Malkki, Yrjo : *See—*
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Maloney, James E.: *See—*
Freis, Richard E.; Maloney, James E.; and Oakes, Thomas R., 4,518,459, Cl. 162-5.000.
Mann, David P.; Kukes, Simon G.; and Coombs, Daniel M. Metals removal with a light hydrocarbon and an organophosphorous compound. 4,518,484, Cl. 208-87.000.
Mannesmann Aktiengesellschaft: *See—*
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Mannesmann Rexroth GmbH: *See—*
Bartholomaus, Reiner; and Gibas, Christoph, 4,518,938, Cl. 335-262.000.
Mucheyer, Norbert; and Schulte, Heinz, 4,518,010, Cl. 137-587.000.
Marchant, Alan B.: *See—*
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Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, to Imperial Chemical Industries PLC. 1-(Tetrahydrofurylmethyl)azoles. 4,518,415, Cl. 71-92.000.
Marconi Avionics Limited: *See—*
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Marconi Instruments, Ltd.: *See—*
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Marder, Herbert B. Apparatus and method for dispensing medicine. 4,518,208, Cl. 312-209.000.
Maries, Alan: *See—*
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Marine Concepts of America: *See—*
Wall, Ronald E., 4,517,759, Cl. 43-7.000.
Mark, David F.; Lin, Leo S.; and Lu, Shi-Da Y., to Cetus Corporation. Human recombinant interleukin-2 muteins. 4,518,584, Cl. 424-85.000.
Markusch, Peter H.; Kelso, Robert G.; and Schmitt, Peter D., to Mobay Chemical Corporation. Blocked polyisocyanates with improved storage stability. 4,518,522, Cl. 252-188.310.
Marq Packaging Systems, Inc.: *See—*
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Marschall-Helman, Ellen: *See—*
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Marshall, Bryce G., to Leesona Corporation. Take-up mechanism. 4,518,126, Cl. 242-18.00R.
Martin, George E. Newspaper dispensing machine. 4,518,100, Cl. 221-225.000.
Martin, Henry, to Ciba-Geigy Corporation. Compositions, which promote plant growth and protect plants, based on oxime ethers and oxime esters. 4,518,536, Cl. 260-465.00D.

Martin, Howard. Rapid X-ray developing system. 4,518,684, Cl. 430-403.000.

Martinez, Louis, to McGraw-Edison Company. Method and apparatus for automatically establishing telephone communication links. 4,518,822, Cl. 179-2.00E.

Maruzen Oil Co., Ltd.: *See*—
Hori, Takashi; Ueda, Sanae; and Kojima, Yoshihiro, 4,518,807, Cl. 568-716.000.

Marvin Glass & Associates: *See*—
Zaruba, John V.; and Meyer, Burton C., 4,518,367, Cl. 446-373.000.

Maryland Cup Corporation: *See*—
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Mashimo, Satoshi; Tanaka, Masayuki; and Yamaguchi, Yoshio, to Mitsuboshi Belting Ltd. Toothed belt. 4,518,375, Cl. 474-205.000.

Mashimo, Satoshi; Kakiuchi, Hazime; and Nakajima, Masayoshi, to Mitsuboshi Belting Ltd. Power transmission belt manufacture. 4,518,376, Cl. 474-261.000.

Mason, John J.; Cunningham, Michael T.; and Crosby, Jeffrey N., to INCO Selective Surfaces Limited. Selective solar surfaces. 4,518,467, Cl. 204-37.100.

Massachusetts Institute of Technology: *See*—
Leonberger, Frederick J.; Melngailis, Ivars; Bozler, Carl O.; and McClelland, Robert W., 4,518,219, Cl. 350-96.120.

Mastin, James: *See*—
Williams, Robert D.; and Mastin, James, 4,518,191, Cl. 296-91.000.

Masuda, Eiji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS Switch circuit with consistent low on resistance. 4,518,880, Cl. 307-577.000.

Masuda, Fumihiko, to Shin Nihon Machine Manufacturing Co., Ltd. Automatic confectionary-and-likes manufacturing equipment. 4,517,785, Cl. 53-116.000.

Masuda, Yoshinori: *See*—
Fukushima, Isao; Kobori, Yasunori; Nishijima, Hideo; and Masuda, Yoshinori, 4,518,901, Cl. 318-328.000.

Masugi, Takashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Masumoto, Hakaru; and Nakamura, Naoji, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Alloy with small change of electric resistance over wide temperature range and method of producing the same. 4,518,439, Cl. 148-3.00ò.

Masumoto, Nobuyoshi: *See*—
Yokoshima, Naohiko; Masumoto, Nobuyoshi; and Sui, Akira, 4,517,726, Cl. 29-527.400.

Mather, Naomi. Educational toy and method. 4,518,358, Cl. 434-195.000.

Matsubara, Toshiya: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Matsubara, Toshiya, 4,518,470, Cl. 204-98.000.

Matsuda, Masakane: *See*—
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Matsuda, Morio; and Horio, Masamitsu, to Kao Corporation. Process for preparation of Guerbet alcohols. 4,518,810, Cl. 568-905.000.

Matsuda, Shinpei: *See*—
Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, 4,518,665, Cl. 429-153.000.

Matsui, Takeski; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, to Nippondenso Co., Ltd. Optimizing spark timing control apparatus and method. 4,519,038, Cl. 364-431.030.

Matsumoto, Akio; and Yokota, Mitsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Delayed turn-off control for vehicle pumping device. 4,518,903, Cl. 318-481.000.

Matsumoto, Akio: *See*—
Seki, Kimiaki; and Matsumoto, Akio, 4,518,333, Cl. 418-152.000.

Matsumoto, Shigemi: *See*—
Muramatsu, Eiichi; Matsumoto, Shigemi; and Nagoshi, Fumiya, 4,518,742, Cl. 525-67.000.

Matsumoto, Takeshi: *See*—
Okabayashi, Yoshikatsu; Nakamura, Noboru; Matsumoto, Takeshi; and Osumi, Yoshimasa, 4,518,704, Cl. 502-80.000.

Matsunuma, Tamotsu, to Bridgestone Tire Company Limited. Pneumatic radial tire having an improved durability in the running on bad road. 4,518,024, Cl. 152-361.0DM.

Matsuo, Kenji: *See*—
Masuda, Eiji; and Matsuo, Kenji, 4,518,880, Cl. 307-577.000.

Matsuo, Tadao; Matsuoka, Fumio; Yokota, Nobuo; and Yamamoto, Masaaki, to Mitsuboshi Belting Ltd. Method of producing accurately sized material of ultra high molecular weight polyethylene. 4,518,552, Cl. 264-126.000.

Matsuoka, Fumio: *See*—
Matsuo, Tadao; Matsuoka, Fumio; Yokota, Nobuo; and Yamamoto, Masaaki, 4,518,552, Cl. 264-126.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Asada, Shuji; and Nanbu, Tadamasa, 4,517,757, Cl. 38-88.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,517,909, Cl. 112-275.000.

Matsuura, Kazuo: *See*—
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Matsuzaki, Masatoshi; Yamazaki, Toshinori; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Recording material for electrophotography comprising amorphous silicon containing nitrogen. 4,518,670, Cl. 430-58.000.

Mattei, Riccardo: *See*—
Seragnoli, Enzo; and Mattei, Riccardo, 4,517,871, Cl. 83-677.000.

Matuschek, Josip, to Textron Inc. Multi-part fastening nut, including jam nut. 4,518,295, Cl. 411-291.000.

Mauthe, Peter: *See*—
Gebauer, Ludwig; Irmscher, Hans-Jurgen; Lang, Gusztav; and Mauthe, Peter, 4,518,283, Cl. 405-260.000.

Maxwell Laboratories, Inc.: *See*—
Burns, Eugene A.; and Colby, Bruce N., 4,518,502, Cl. 210-634.000.

May, Anthony A.: *See*—
Bilimoria, Bomi M.; and May, Anthony A., 4,518,491, Cl. 209-166.000.

May, Denis R. W.; and Hiddleston, James N., to J. D. Hanger & Company Limited. Artificial leg for occasional use. 4,517,688, Cl. 3-2.000.

Mayer, Andreas; El-Neshar, Ibrahim; and Spinnler, Fritz, to BBC Brown, Boveri & Company, Limited. Method and device for controlling the recirculation of exhaust gas in a pressure wave supercharger for an internal combustion engine. 4,517,950, Cl. 123-559.000.

Mayer, Oscar C., Jr., to Woodstream Corporation. Poultry trussing device cartridge. 4,518,083, Cl. 206-340.000.

Maytag Company, The: *See*—
Bales, Michael E., 4,517,886, Cl. 99-425.000.

Mazda Motor Corporation: *See*—
Nagaoka, Mitsuru; and Yasuno, Mitsuo, 4,517,859, Cl. 74-866.000.
Nishikawa, Toshio; Kaneko, Tadashi; and Othuka, Kazutoshi, 4,517,947, Cl. 123-489.000.

McAlpine & Co., Ltd.: *See*—
McAlpine, James E., 4,518,014, Cl. 137-843.000.

McAlpine, James E., to McAlpine & Co., Ltd. Relief valves for sanitation systems or the like. 4,518,014, Cl. 137-843.000.

McCallum, Michael. Wheelchair transporting with selectively raisable platform means. 4,518,057, Cl. 180-210.000.

McCan, Duane A.; and Smith, Carl L., Jr., to Valley Sales Co. Animal headgate. 4,517,924, Cl. 119-98.000.

McClelland, Robert W.: *See*—
Leonberger, Frederick J.; Melngailis, Ivars; Bozler, Carl O.; and McClelland, Robert W., 4,518,219, Cl. 350-96.120.

McCombs, Howard L., Jr., to Allied Corporation. Power lever apparatus for a turbine engine. 4,517,796, Cl. 60-39.281.

McCutcheon, Hugh W.: *See*—
Twomey, James R.; McCutcheon, Hugh W.; and Harris, Richard K., 4,517,842, Cl. 73-701.000.

McDevitt, Bernard J.: *See*—
Crozier, George W.; and McDevitt, Bernard J., 4,519,047, Cl. 364-900.000.

McDonnell Douglas Corporation: *See*—
Zuleeg, Rainer, 4,518,255, Cl. 356-5.000.

McGinity, James W.: *See*—
Cuff, George W.; and McGinity, James W., 4,518,547, Cl. 264-4.700.

McGinley, Emanuel J.; and Tuason, Domingo C., Jr., to FMC Corporation. Enteric coating for pharmaceutical dosage forms. 4,518,433, Cl. 106-180.000.

McGraw-Edison Company: *See*—
Martinez, Louis, 4,518,822, Cl. 179-2.00E.
Shiffer, Robert J., 4,518,185, Cl. 294-67.100.

McMahill, Patrick D.: *See*—
Mitchell, Thomas L.; McMahill, Patrick D.; Valbert, Gary G.; and Wellauer, John C., 4,518,276, Cl. 403-13.000.

McMahon, Donald H.; and Spillman, William B., Jr., to Sperry Corporation. Temperature and pressure compensated elasto-optic sensor. 4,518,857, Cl. 250-225.000.

McWilliams, Donald E.; Melle, Carl A.; and Das, Balbhadra, to PPG Industries, Inc. Chemically treated glass fibers for reinforcing polymeric materials and processes. 4,518,653, Cl. 428-378.000.

Mead Corporation, The: *See*—
Suttles, James M., 4,518,279, Cl. 403-231.000.

Meadox Medicals, Inc.: *See*—
Liebig, William J.; and Cummings, Dennis, 4,517,687, Cl. 3-1.400.

Medimpex Gyogyszerkuelkereskedelmi Vaallalat: *See*—
Kahan, Agostne, 4,518,608, Cl. 514-420.000.

Meiers, Gerald F., to Deere & Company. Bale-shape gauge for baler for forming cylindrical bales. 4,517,795, Cl. 56-341.000.

Meignant, Didier S., to U.S. Philips Corporation. Method of providing a small-sized opening, use of this method for the manufacture of field effect transistors having an aligned gate in the submicron range and transistors thus obtained. 4,517,730, Cl. 29-571.000.

Meinberg, Nancy A.: *See*—
Benjamin, Lawrence; Rodriguez, Sheila S.; and Meinberg, Nancy A., 4,517,919, Cl. 119-1.000.

Meisner, Donald D. Universal can crusher. 4,517,892, Cl. 100-292.000.

Melle, Carl A.: *See*—
McWilliams, Donald E.; Melle, Carl A.; and Das, Balbhadra, 4,518,653, Cl. 428-378.000.

Mellen, Robert H., Sr. Method of providing a dynamic temperature gradient. 4,518,351, Cl. 432-18.000.

Melngailis, Ivars: *See*—
Leonberger, Frederick J.; Melngailis, Ivars; Bozler, Carl O.; and McClelland, Robert W., 4,518,219, Cl. 350-96.120.

Melocik, Grant C.; and Pickering, William, to Towmotor Corporation. Plugging electrical braking control circuit. 4,518,902, Cl. 318-373.000.

Melrose, Clayton: *See*—
Anderson, Jack F.; Melrose, Clayton; and Melrose, Floyd, 4,518,043, Cl. 172-6.000.

Melrose, Floyd: *See—*
Anderson, Jack F.; Melrose, Clayton; and Melrose, Floyd, 4,518,043, Cl. 172-6.000.

Mendell, Harry B., to AT&T Bell Laboratories. Memory management arrangement for microprocessor systems. 4,519,032, Cl. 364-200.000.

Mennel, Gabriel B.: *See—*
Faessel, Andre ; Mennel, Gabriel B.; and Michaux, Jacques M., 4,518,660, Cl. 428-577.000.

Mensik, John A. Cigarette holder and filter cartridge. 4,517,989, Cl. 131-187.000.

Merck & Co., Inc.: *See—*
Johnston, David B. R., 4,518,599, Cl. 514-255.000.

Merkle, Josef, to Daimler-Benz Aktiengesellschaft. Pneumatic spring, especially for motor vehicles. 4,518,154, Cl. 267-34.000.

Mermi, Kurt: *See—*
Frichmann, Albert; Sternisa, Danilo; Mermi, Kurt; and Kistner, Herbert, 4,518,290, Cl. 411-30.000.

Meshako, Thomas M.: *See—*
Krueger, Ulf A.; and Meshako, Thomas M., 4,518,762, Cl. 528-95.000.

Metalines, Inc.: *See—*
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Metals Production Research, Inc.: *See—*
Murphy, Andrew H., 4,518,426, Cl. 75-112.000.

Metz, Paul, to Arbed S.A. Process and apparatus for refining steel in a metallurgical vessel. 4,518,422, Cl. 75-58.000.

Meyer, Burton C.: *See—*
Zaruba, John V.; and Meyer, Burton C., 4,518,367, Cl. 446-373.000.

Meyer, Knut. Method and apparatus for detecting leakage in a fluid conduit system. 4,518,955, Cl. 340-605.000.

Meyer, Willy; Fory, Werner; and Topfl, Werner, to Ciba Geigy Corporation. Process for producing sulfonylureas. 4,518,776, Cl. 544-206.000.

Michaux, Jacques M.: *See—*
Faessel, Andre ; Mennel, Gabriel B.; and Michaux, Jacques M., 4,518,660, Cl. 428-577.000.

Michel, Thomas J., to Unger, Harold. Image-erecting barrel rotator for articulated optical arm. 4,517,963, Cl. 128-6.000.

Micheron, Francois: *See—*
Ravinet, Pierre; and Micheron, Francois, 4,518,555, Cl. 264-292.000.

Micropore International Limited: *See—*
Grasso, Alfie L., 4,518,850, Cl. 219-505.000.

Microtech Associates: *See—*
Endelson, Robert A., 4,517,994, Cl. 131-329.000.

Middleton, James D., to Halliburton Company. Method of fracturing a subterranean formation. 4,518,040, Cl. 166-307.000.

Miettinen, Jorma K.; and Virtanen, Eero J., to Makrotalo Oy. Method of manufacturing rigid frame building elements filled with hard foam plastic. 4,518,550, Cl. 264-46.500.

Mihara, Yuji: *See—*
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Yagihara, Morio; Ikegawa, Akihiko; Ono, Mitsunori; and Mihara, Yuji, 4,518,685, Cl. 430-505.000.

Milberger, Ernest C.: *See—*
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Miles, Earl F., Jr., to Indy Lighting, Inc. Dual voltage lighting fixture. 4,518,896, Cl. 315-162.000.

Miles Laboratories, Inc.: *See—*
Boger, David L.; Pugh, Jerry T.; and Zuidema, Jack, 4,518,565, Cl. 422-58.000.

Millen, Edward G., to Morton Thiokol, Inc. Curing of polysulfide liquid polymers with zinc oxide and a source of copper ions. 4,518,767, Cl. 528-374.000.

Miller, Darwin L.; and Miller, Ronnie F., to Damco Testers, Inc. Apparatus for leak testing of pipe. 4,517,828, Cl. 73-46.000.

Miller, Frank E.: *See—*
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Miller, Henry W., to Mobil Oil Corporation. Subsea wellhead connection assembly. 4,518,042, Cl. 166-347.000.

Miller, Richard L.: *See—*
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.

Miller, Richard W., to Foxboro Company, The. Flowmeter having uniform response under both laminar and turbulent flow conditions. 4,517,847, Cl. 73-861.740.

Miller, Robert L., to International Telephone and Telegraph Corporation. Phase-locked loop and clock circuit for a line switch. 4,519,071, Cl. 370-100.000.

Miller, Ronnie F.: *See—*
Miller, Darwin L.; and Miller, Ronnie F., 4,517,828, Cl. 73-46.000.

Miller, William R.; and Prasad, Chandrika, to International Business Machines Corporation. Process for controlled braze joining of electronic packaging elements. 4,518,112, Cl. 228-124.000.

Milton, James W.; and Boig, Robert W., to Van Dorn Co. Plastic container and closure. 4,518,097, Cl. 220-307.000.

Milwaukee Valve Company: *See—*
Fenster, Abraham S.; and Buechler, Lawrence W., 4,518,008, Cl. 137-552.000.

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Minamida, Kazukiyo; and Asai, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of indicating results of combinatorial computations. 4,519,042, Cl. 364-567.000.

Minnesota Mining and Manufacturing Company: *See—*
Gebeke, Charles D., 4,518,135, Cl. 242-199.000.
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Minolta Camera Kabushiki Kaisha: *See—*
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Misawa Home Co., Ltd.: *See—*
Hanaoka, Tadashi; and Umezu, Hiroaki, 4,517,799, Cl. 62-323.100.

Misawa, Takashi: *See—*
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, 4,518,962, Cl. 340-870.280.

Misumi, Teruo; and Osato, Yoichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive Se or Se alloy doped with oxygen. 4,518,671, Cl. 430-84.000.

Mita Industrial Company Limited: *See—*
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Mitchell, Thomas L.; McMahill, Patrick D.; Valbert, Gary G.; and Wellauer, John C., to Caterpillar Tractor Co. Method and apparatus for repeatably aligning adjacent member. 4,518,276, Cl. 403-13.000.

Mitchell, Thomas O.: *See—*
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Mitrofanov, Viktor A.: *See—*
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Mitschke, Helmut, to International Standard Electric Corporation. Device for flicker-free reproduction of television pictures and text and graphics pages. 4,518,984, Cl. 358-11.000.

Mitsubishi Chemical Industries Limited: *See—*
Iida, Seiu; Inokuchi, Tomio; and Munakata, Hiroaki, 4,518,591, Cl. 424-195.100.
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Kaneyuki, Kazutoshi, 4,518,886, Cl. 310-71.000.
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Seki, Kimiaki; and Matsumoto, Akio, 4,518,333, Cl. 418-152.000.
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Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See—*
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Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
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Mitsubishi Rayon Company Ltd.: *See—*
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Mitsuboshi Belting Ltd.: *See—*
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Miyakawa, Eiji, to Miyakawa Industry Co., Ltd. Gear interference preventing mechanism in multi-spindle head attachment. 4,517,857, Cl. 74-665.0GA.

Miyakawa Industry Co., Ltd.: *See—*
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Miyake, Toshio; Yoshida, Mikihiko; and Takeuchi, Kano , to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Imparting low- or anti-cariogenic property to orally-usable products. 4,518,581, Cl. 424-48.000.

Miyaki, Takeo: *See*—
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Mizogami, Shigeyoshi; and Akimoto, Shinichi, to Idemitsu Kosan Company Limited. Process for the production of polyethylene. 4,518,751, Cl. 526-114.000.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Indicator for proper or improper exposure by automatic electronic flash. 4,518,237, Cl. 354-127.100.
Mizuno, Takeo; Uchikawa, Naoshi; Murayama, Akira; and Tamura, Takahiro, to Hitachi, Ltd. Sealed type electrically operated compressor. 4,518,324, Cl. 417-366.000.
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Mollet, Hans; and Dussy, Paul, to Ciba Geigy Corporation. Process for the HT dyeing of polyester materials with ethylene oxide propylene oxide block polymer. 4,518,392, Cl. 8-609.000.
Monagle, Charles W.; and Smith, Janet C., to Central Soya Company, Inc. Process for breading food. 4,518,620, Cl. 426-291.000.
Monahan, William Jay: *See*—
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Mondardini, Massimo, to Urmet Sud S.P.A. Public telephone method and apparatus wherein the user's personal telephone number and a personal dialing code are used to effect debiting charges. 4,518,824, Cl. 179-6.3CC.
Monden, Norbert, to Hermann Heye. Method of and apparatus for making a parison. 4,518,409, Cl. 65-79.000.
Monsanto Company: *See*—
Croskell, Henry; and Graham, Tommy E., 4,518,399, Cl. 55-16.000.
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Monteyne, Guido, to Paul Wurth S.A. Metallurgical slag filtering apparatus which effects uniform charging of a conveyer belt. 4,518,498, Cl. 210-297.000.
Moog Automotive, Inc.: *See*—
Fister, Louis P.; Pearson, Herby O.; and Fitch, Lawrence H., 4,518,058, Cl. 180-300.000.
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Moriguchi, Haruhiko; and Inui, Toshiharu, to Fuji Xerox Co., Ltd. Transfer type heat sensitive recording medium. 4,518,645, Cl. 428-212.000.
Morimoto, Etsuji; and Orito, Keijiro, to Oki Electric Industry Co., Ltd. Method of manufacturing printed wiring boards. 4,518,465, Cl. 204-15.000.
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Morin, J. Donald, to Hospital For Sick Children, The. Corneal template set. 4,517,747, Cl. 33-178.00B.
Morino, Seiji; and Kawai, Hisasi, to Nippon Soken, Inc. Electromagnetic linear driving device. 4,518,882, Cl. 310-15.000.
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Morrison, Donald, to Morrison Company, Inc. Agricultural belting material. 4,518,647, Cl. 428-250.000.
Morrison, Eric F., to Ampex Corporation. Apparatus for providing dropout compensation and error concealment in a PAL format video information signal. 4,519,001, Cl. 358-310.000.
Morrison, Robert A., to Lockheed Corporation. Zero-insertion-force housing for circuit boards. 4,518,210, Cl. 339-17.0LM.
Morton Thiokol, Inc.: *See*—
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Moser, William H., to Barham, Jerel J.; and Clegg, Lynaveta, part interest to each. Movable floor self-unloading trailer. 4,518,303, Cl. 414-528.000.
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Mosier, Donald E.: *See*—
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Moulding, Kenneth W., to U.S. Philips Corporation. "All-pass" filter circuit including an integrable band-pass filter circuit. 4,518,878, Cl. 307-520.000.
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Caudill, Eddie T.; Caudill, Richard T.; and Conley, Lyle N., 4,518,826, Cl. 179-37.000.
Movshovitz, Avner; and Ityel, Amos, to Amcor Ltd. Heat pumping system. 4,517,808, Cl. 62-160.000.
Mucha, Basil, to Teleflex Incorporated. Remotely controllable vent door. 4,517,765, Cl. 49-3.000.
Muchel, Franz; and Strahle, Fritz, to Carl-Zeiss-Stiftung. Stereomicroscope. 4,518,231, Cl. 350-516.000.
Mucheyer, Norbert; and Schulte, Heinz, to Mannesmann Rexroth GmbH. Pressure container for two hydraulic circuits. 4,518,010, Cl. 137-587.000.
Mueller, Carl J.; and Haefner, John S., to Emerson Electric Co. Direct ignition gas burner control system. 4,518,345, Cl. 431-24.000.
Mueller, Edward E.; and Jensen, Paul L., to Whirl-Air-Flow Corporation. Apparatus and method for calcining sand. 4,518,350, Cl. 432-13.000.
Muellner, James M.; and Pastien, Eugene R. Cart conveyor and dispenser apparatus. 4,518,072, Cl. 194-4.00D.
Muench, Volker: *See*—
Naarmann, Herbert; Muench, Volker; Kohler, Gernot; and Simak, Petr, 4,518,535, Cl. 260-438.100.
Muething, Kevin A., to AT&T Technologies, Inc. CVD Process. 4,518,455, Cl. 156-613.000.
Muhlenbeck, Josef: *See*—
Schudlich, Kurt; Vielstich, Gunter; Muhlenbeck, Josef; Otto, Josef; Bauer, Hannsgeorg; Zollner, Dieter H.; and Rittmann, Friedrich, 4,518,365, Cl. 445-67.000.
Muir, Earl B.: *See*—
Elson, John P.; Muir, Earl B.; and Riffe, Delmar R., 4,518,323, Cl. 417-312.000.
Muller, Erich: *See*—
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,518,596, Cl. 514-232.000.
Muller, Hanns P.: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Riberi, Bernd; and Frohlich, Jurg, 4,518,761, Cl. 528-67.000.
Muller, Hubert: *See*—
Bussing, Jurgen; and Muller, Hubert, 4,518,732, Cl. 524-178.000.

Muller, Rolf: *See*—
Elsaesser, Dieter; von der Heide, Johann; Muller, Rolf; and Papst, Georg, 4,519,010, Cl. 360-97.000.
Mullner, Paul: *See*—
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; and Mullner, Paul, 4,518,417, Cl. 75-10.00R.
Munakata, Hiroaki: *See*—
Iida, Seiu; Inokuchi, Tomio; and Munakata, Hiroaki, 4,518,591, Cl. 424-195.100.
Munetsugu, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Small-sized electronic calculator capable of functioning as a musical instrument. 4,519,044, Cl. 364-709.000.
Murakoshi, Makoto; and Ota, Takahiro, to Fuji Photo Film Co., Ltd. High frequency scalpel and endoscope system and method of operating same. 4,517,976, Cl. 128-303.150.
Muramatsu, Eiichi; Matsumoto, Shigemi; and Nagoshi, Fumiya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition having toughness and high heat distortion resistance. 4,518,742, Cl. 525-67.000.
Muramatsu, Masamitsu: *See*—
Takahashi, Hideaki; Shoji, Tetsuo; Saitoh, Kiyoshi; Muramatsu, Masamitsu; and Kimura, Kazushige, 4,518,464, Cl. 204-1.00T.
Murata, Akio: *See*—
Kobayashi, Hisamine; Ishiguro, Tomihiro; and Murata, Akio, 4,517,771, Cl. 51-163.200.
Murata Kikai Kabushiki Kaisha: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,517,794, Cl. 57-304.000.
Murata, Tomoji; Hayashi, Masamichi; Goto, Yasuo; and Sakurai, Seiichi, to Minolta Camera Kabushiki Kaisha. Slit illumination system for copying machine and the like. 4,518,249, Cl. 355-67.000.
Murayama, Akira: *See*—
Mizuno, Takao; Uchikawa, Naoshi; Murayama, Akira; and Tamura, Takahiro, 4,518,324, Cl. 417-366.000.
Muro Kinzoku Kogyo Co., Ltd.: *See*—
Ishikawa, Shigeru, 4,517,863, Cl. 81-434.000.
Murphy, Andrew H., to Metals Production Research, Inc. Process for electrolytic recovery of titanium metal sponge from its ore. 4,518,426, Cl. 75-112.000.
Murphy, Frank; and Peterson, William F. Syringe injection apparatus with adjustable dosage indicator. 4,518,387, Cl. 604-187.000.
Murr, John, Jr.: *See*—
Kane, James; and Murr, John, Jr., 4,518,893, Cl. 313-479.000.
Murray, Kevin P.: *See*—
Sekmakas, Kazys; Shah, Raj; Lewarchik, Ronald J.; and Murray, Kevin P., 4,518,746, Cl. 525-443.000.
Musgrove, Robert G., to LTV Aerospace and Defense Company. Vehicular steering apparatus employing an eccentric actuator. 4,518,170, Cl. 280-96.000.
Musick, Donald R.; and Howell, Edward H., to International Harvester Company. Self-adjusting cooling system for diesel engines. 4,517,929, Cl. 123-41.100.
Myers, Garry L.: *See*—
Wang, Richard H. S.; and Myers, Garry L., 4,518,808, Cl. 568-765.000.
N. V. Raychem S.A.: *See*—
Henry, Rene H.; and Nolf, Jean M. E., 4,518,448, Cl. 156-86.000.
Naarmann, Herbert; Muench, Volker; Kohler, Gernot; and Simak, Petr, to BASF Aktiengesellschaft. Preparation of electrically conductive systems from substituted phenalenes, and the products obtained. 4,518,535, Cl. 260-438.100.
Nabisco Brands, Inc.: *See*—
Wilson, Mildred N.; Danielson, Robert L.; Bosco, Peter M.; and Steensen, Wayne L., 4,518,622, Cl. 426-578.000.
Nadalaan S.A.: *See*—
Shamszadeh, Khosrow, 4,517,782, Cl. 52-309.700.
Nagahara, Toshio: *See*—
Tani, Shigetaka; and Nagahara, Toshio, 4,517,853, Cl. 74-89.150.
Nagaoka, Mitsuru; and Yasuno, Mitsuo, to Mazda Motor Corporation. Shift up clutch control in a multiple clutch type gear transmission for automobile. 4,517,859, Cl. 74-866.000.
Nagasawa, Masanori: *See*—
Suzuki, Yasuo; Hirao, Hiroshi; and Nagasawa, Masanori, 4,518,873, Cl. 307-451.000.
Nagasawa, Toshio: *See*—
Banno, Takashi; Seki, Tadashi; Kawaguchi, Masafumi; Tanaka, Yukio; Iwasaki, Morikatsu; and Nagasawa, Toshio, 4,518,353, Cl. 432-205.000.
Nagasawa, Tsunehiko: *See*—
Takenouchi, Tsutomu; Nagasawa, Tsunehiko; and Nanasawa, Masatada, 4,519,008, Cl. 360-79.000.
Nagel, Arthur A.: *See*—
Hauske, James R.; and Nagel, Arthur A., 4,518,590, Cl. 514-29.000.
Nagoshi, Fumiya: *See*—
Muramatsu, Eiichi; Matsumoto, Shigemi; and Nagoshi, Fumiya, 4,518,742, Cl. 525-67.000.
Nakagawa, Norihisa, to Toyota Jidosha Kabushiki Kaisha. Air introduction system of a fuel injection type engine. 4,517,941, Cl. 123-336.000.
Nakagiri, Tadahiko: *See*—
Osaka, Takatoshi; Nishimura, Katsuo; and Nakagiri, Tadahiko, 4,517,953, Cl. 124-17.000.
Nakahori, Ichiro; Nakayama, Shigeki; Maeda, Mitsuo; Yamauchi, Shiro; and Ozawa, Junichiro, to Mitsubishi Denki Kabushiki Kaisha. Sampling system for water quality sensors. 4,517,849, Cl. 73-863.310.
Nakai, Fumio: *See*—
Okubo, Masao; Yoshimitsu, Yasuro; Nakai, Fumio; and Garretson, Oliver R., 4,518,914, Cl. 324-158.00F.
Nakajima, Masayoshi: *See*—
Mashimo, Satoshi; Kakiuchi, Hazime; and Nakajima, Masayoshi, 4,518,376, Cl. 474-261.000.
Nakajima, Tamotsu: *See*—
Yoshida, Shusuke; Nakajima, Tamotsu; and Okamoto, Miyoshi, 4,517,715, Cl. 28-144.000.
Nakamichi Corporation: *See*—
Nakamichi, Niro, 4,519,006, Cl. 360-76.000.
Nakamichi, Niro, to Nakamichi Corporation. Magnetic head device. 4,519,006, Cl. 360-76.000.
Nakamura, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet sorting apparatus. 4,518,161, Cl. 271-303.000.
Nakamura, Mikihiko: *See*—
Aoshima, Atsushi; Suzuki, Yoshio; and Nakamura, Mikihiko, 4,518,462, Cl. 203-39.000.
Nakamura, Naoji: *See*—
Masumoto, Hakaru; and Nakamura, Naoji, 4,518,439, Cl. 148-3.000.
Nakamura, Noboru: *See*—
Okabayashi, Yoshikatsu; Nakamura, Noboru; Matsumoto, Takeshi; and Osumi, Yoshimasa, 4,518,704, Cl. 502-80.000.
Nakamura, Teruya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.
Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; and Matsuura, Kazuo, 4,518,752, Cl. 526-116.000.
Nakano, Hideaki; Ozu, Tadahiro; and Shirai, Eiichi, to Kawasaki Jukogyo Kabushiki Kaisha. Piston of combustion engine. 4,517,930, Cl. 123-41.310.
Nakayama, Shigeki: *See*—
Nakahori, Ichiro; Nakayama, Shigeki; Maeda, Mitsuo; Yamauchi, Shiro; and Ozawa, Junichiro, 4,517,849, Cl. 73-863.310.
Nakayama, Takao, to Fuji Photo Film Co., Ltd. Method for preparing a lithographic printing plate. 4,518,668, Cl. 430-49.000.
Nanasawa, Masatada: *See*—
Takenouchi, Tsutomu; Nagasawa, Tsunehiko; and Nanasawa, Masatada, 4,519,008, Cl. 360-79.000.
Nanbu, Tadamasa: *See*—
Asada, Shuji; and Nanbu, Tadamasa, 4,517,757, Cl. 38-88.000.
Nancarrow, James H.: *See*—
Kobayashi, Robert J.; Nancarrow, James H.; and Alger, Jeffrey L., 4,517,802, Cl. 60-606.000.
Narda Microwave Corporation, The: *See*—
Asian, Edward E., 4,518,912, Cl. 324-95.000.
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, to Dr. Karl Thomae GmbH. Substituted benzoxazin-2-ones and pharmaceutical compositions containing them. 4,518,597, Cl. 514-228.000.
Narr, Berthold: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,518,596, Cl. 514-232.000.
Naruo, Kyoichi: *See*—
Okita, Tsutomu; and Naruo, Kyoichi, 4,518,656, Cl. 428-403.000.
Naruse, Akisuke: *See*—
Takaku, Kazuo; Naruse, Akisuke; Fujimoto, Hirotsugu; and Kimura, Hiroshi, 4,518,560, Cl. 376-245.000.
Nason, Martin L. Paired beam engines and pumps. 4,517,932, Cl. 123-54.00A.
Natchev, Emil. Support for hand and knee at work on low level. 4,518,060, Cl. 182-230.000.
Nath, Dilip K.: *See*—
Biswas, Dipak R.; and Nath, Dilip K., 4,518,628, Cl. 427-55.000.
National Foundation for Cancer Research, Inc.: *See*—
Veltri, Robert W., 4,518,611, Cl. 514-470.000.
National Patent Development Corporation: *See*—
Rabenau, Richard; and Ryder, Jeffery A., 4,518,390, Cl. 8-507.000.
National Research Development Corporation: *See*—
Cox, Michael; Gray, Michael J.; and Duke, Phillip W., 4,518,420, Cl. 75-26.000.
Hately, Maurice C., 4,518,968, Cl. 343-802.000.
Klinner, Wilfred E.; and Knight, Andrew C., 4,518,124, Cl. 241-101.700.
Richards, David H.; and Stewart, Malcolm J., 4,518,753, Cl. 526-177.000.
National Semiconductor Corporation: *See*—
Goodrich, Gary B.; and Belani, Jadish G., 4,518,735, Cl. 524-403.000.
Priel, Ury; Yaron, Giora; and Ebel, Mark S., 4,519,076, Cl. 371-21.000.
National Starch and Chemical Corporation: *See*—
Gleason, Patricia A.; and Brase, Ingrid E., 4,518,510, Cl. 252-8.50C.
Naumann, Ted F., Jr.: *See*—
Thompson, Craig R.; Carnes, Ronald C.; and Naumann, Ted F., Jr., 4,517,840, Cl. 73-644.000.
Nawata, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse motor driving apparatus. 4,518,900, Cl. 318-102.000.
NCR Corporation: *See*—
George, Rick A., 4,518,272, Cl. 400-705.100.

NEC Corporation: *See—*
Kanai, Tetsuro, 4,518,949, Cl. 340-347.0AD.
Shimizu, Shigeaki; Kubo, Yoshimi; Arai, Yoshio; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,517,727, Cl. 29-570.000.
Yano, Takeshi; Fukui, Izumu; Hamatsuki, Takeshige; Sato, Eiichi; and Inui, Osamu, 4,518,887, Cl. 310-328.000.
Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek: *See—*
Wolters, Leendert, 4,517,928, Cl. 123-27.0GE.
Needham, James C., to Welding Institute, The. Short-circuit MIG welding. 4,518,844, Cl. 219-137.0PS.
Neese, Wayne E.: *See—*
Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,518,211, Cl. 339-17.0LM.
Negley, Loren E., to Welcon Connector Company. Connector block with RF shield. 4,518,209, Cl. 339-14.00R.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Sewing machine having a digital command circuit. 4,517,909, Cl. 112-275.000.
Nelson, Carl D. Variable stroke engine. 4,517,931, Cl. 123-48.00B.
Nelson, Roger J., to Deere & Company. Vehicle with coolant pressure responsive hitch control. 4,518,045, Cl. 172-7.000.
Nemoto, Kiyoshi, to Kabushiki Kaisha Murayama Seisakusho. Piston for piston pump. 4,518,328, Cl. 417-511.000.
NESELCO: *See—*
Sorensen, Gunnar; and Svendsen, Leo, 4,518,738, Cl. 524-435.000.
Neszmelyi, Erzsebet: *See—*
Takacs, Istvan; Kerey, Gyorgy; Illes, Janos; Rudolf, Peter; Gere, Pal; Czebe, Laszlo ; and Neszmelyi, Erzsebet, 4,518,771, Cl. 536-21.000.
Netzer, Yishay. Vertical indicating method and device. 4,517,750, Cl. 33-396.000.
Neuray, Dieter: *See—*
Stix, Wolfgang; Bottenbruch, Ludwig; and Neuray, Dieter, 4,518,747, Cl. 525-462.000.
Neville, Thomas: *See—*
Rademacher, Darrell; Neville, Thomas; and Simpson, Roger T., 4,519,088, Cl. 377-16.000.
New Life Foundation: *See—*
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,517,925, Cl. 122-2.000.
Newberry, Michael E., to Petrolite Corporation. Particulate compositions. 4,518,509, Cl. 252-8.300.
Newby, Gerald R. Steam-sieve method and apparatus. 4,518,400, Cl. 55 68.000.
New Log International, Inc.: *See—*
Jewer, Alan A., 4,519,054, Cl. 369-30.000.
NG, Sau-Lan L.; Plewes, John T.; and Robbins, Murray, to AT&T Technologies, Inc. Method of making non-precious metal electrical contacts by electroplating. 4,518,469, Cl. 204-44.500.
Niagara Blower Company: *See—*
Kals, Walter, 4,517,805, Cl. 60-688.000.
Nicholas, Mark L.: *See—*
Blum, Patricia R.; Milberger, Ernest C.; and Nicholas, Mark L., 4,518,523, Cl. 502-209.000.
Nichols, Roy F., Jr., to General Electric Company. Printed circuit board laminate with arc-resistance. 4,518,646, Cl. 428-248.000.
Nicholson, Walter. Multi-tined claw/rake attachment. 4,517,755, Cl. 37-117.500.
Nickl, Josef: *See—*
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,518,596, Cl. 514-232.000.
Nicolai, Charles M. Earthquake-proof building with improved foundation. 4,517,778, Cl. 52-167.000.
Nielsen, Kurt F.: *See—*
Jensen, Niels D.; Nielsen, Kurt F.; and Larden, Bent, 4,518,318, Cl. 417-53.000.
Nifco Inc.: *See—*
Tanaka, Toshie, 4,517,711, Cl. 24-453.000.
Nigel, Ken: *See—*
Ronco, Kenneth J.; Sommer, Robert; Nigel, Ken; Grimes, Donald; Zirbes, James A.; and Stacey, Robert E., 4,518,077, Cl. 198-731.000.
Nihon Kohden Corporation: *See—*
Harada, Hajime, 4,518,941, Cl. 336-69.000.
Niimi, Morihiro, to Clarion Co., Ltd. Manufacturing method for MIS-type semiconductor device. 4,517,728, Cl. 29-571.000.
Nikitushkin, Nikolai A.: *See—*
Braginsky, Yakov I.; Gultsev, Igor V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; and Yaroshenko, Yury F., 4,517,707, Cl. 17-71.000.
Nilsson, Claes T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,518,340, Cl. 425-393.000.
Nippin Seiko Kabushiki Kaisha: *See—*
Kawakami, Kouichi; and Tanaka, Mamoru, 4,517,852, Cl. 74-89.150.
Nippon Columbia Kabushikikaisha: *See—*
Takagi, Toshihiko; Kobayashi, Yoshikazu; Suzuki, Yoshiji; and Hara, Tsutomu, 4,519,064, Cl. 369-275.000.
Nippon Electric Co., Ltd.: *See—*
Fuji, Tatsuo, 4,519,051, Cl. 365-184.000.
Nippon Light Metal Company Ltd.: *See—*
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,518,466, Cl. 204-28.000.
Nippon Oil Co., Ltd.: *See—*
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; and Matsuura, Kazuo, 4,518,752, Cl. 526-116.000.
Nippon Paint Co., Ltd.: *See—*
Kuwajima, Teruaki; Kida, Katsuaki; and Ishikura, Shinichi, 4,518,724, Cl. 523-501.000.
Nippon Soken, Inc.: *See—*
Kitagawa, Junji; and Akita, Shigeyuki, 4,518,956, Cl. 340-620.000.
Morino, Seiji; and Kawai, Hisasi, 4,518,882, Cl. 310-15.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Yabiki, Akira; Imanishi, Norio; Shibata, Yoji; Kosuge, Wataru; and Yukawa, Nobumichi, 4,518,989, Cl. 358-86.000.
Nippondenso Co., Ltd.: *See—*
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, 4,517,944, Cl. 123-425.000.
Kaji, Yasumasa; Isomura, Shigenori; Harada, Takashi; and Sakakibara, Shuji, 4,517,948, Cl. 123-489.000.
Matsui, Takeski; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, 4,519,038, Cl. 364-431.030.
Nishibori, Toshiki; Kita, Sumio; and Takano, Sakuharu, to Sharp Kabushiki Kaisha. Sheet paper attracting system. 4,518,159, Cl. 271-103.000.
Nishijima, Hideo: *See—*
Fukushima, Isao; Kobori, Yasunori; Nishijima, Hideo; and Masuda, Yoshinori, 4,518,901, Cl. 318-328.000.
Nishikawa, Kazuo; Ichino, Hiroyuki; and Okura, Keniti, to Pioneer Electric Corporation. Phono pickup cartridge. 4,519,063, Cl. 369-172.000.
Nishikawa, Kohei: *See—*
Terao, Shinji; and Nishikawa, Kohei, 4,518,602, Cl. 514-332.000.
Nishikawa, Masaji, to Olympus Optical Company Limited. Apparatus for forming image by developing charge latent image with toner. 4,518,247, Cl. 355-15.000.
Nishikawa, Masaji, to Olympus Optical Company Limited. Apparatus for forming image by developing charge latent image with two component dry developing agent. 4,518,248, Cl. 355-15.000.
Nishikawa, Toshio; Kaneko, Tadashi; and Othuka, Kazutoshi, to Mazda Motor Corporation. Multiple cylinder engine having air-fuel ratio control means in accordance with a signal from an exhaust gas sensor. 4,517,947, Cl. 123-489.000.
Nishimura, Katsuo: *See—*
Osaka, Takatoshi; Nishimura, Katsuo; and Nakagiri, Tadahiko, 4,517,953, Cl. 124-17.000.
Nishimura, Shigeoki: *See—*
Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, 4,518,665, Cl. 429-153.000.
Nishimura, Takeo: *See—*
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,518,674, Cl. 430-108.000.
Nishimura, Yutaka: *See—*
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Nishino, Atsushi: *See—*
Sonetaka, Kazunori; Nishino, Atsushi; and Suzuki, Tadashi, 4,518,347, Cl. 431-325.000.
Nishino, Yoshinori: *See—*
Yamamoto, Masahiko; Nishino, Yoshinori; Komura, Akio; and Ebisu, Tomio, 4,518,556, Cl. 264-295.000.
Nissan Motor Company, Limited: *See—*
Hosoya, Katsumi, 4,517,952, Cl. 123-638.000.
Ishigami, Kazuhiro; Furuhashi, Shoji; and Yuzawa, Haruo, 4,517,945, Cl. 123-425.000.
Kobayashi, Hiroshi, 4,519,012, Cl. 361-284.000.
Kuroki, Junsuke; Irie, Namio; and Tanaka, Haruto, 4,518,169, Cl. 280-6.00R.
Nozawa, Koji, 4,518,071, Cl. 192-106.200.
Seko, Yasutoshi; and Yanagishima, Takayuki, 4,518,954, Cl. 340-576.000.
Yagi, Eiji; Kobari, Yuji; and Takahashi, Sadahiro, 4,518,055, Cl. 180-142.000.
Nittan Company, Limited: *See—*
Tanaka, Hiroshi; Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,518,952, Cl. 340-514.000.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See—*
Sekimoto, Yukihiko; and Okamoto, Osamu, 4,518,261, Cl. 366-150.000.
NL Industries, Inc.: *See—*
Zabcik, Clarence J., 4,518,888, Cl. 310-334.000.
Noda, Koshi: *See—*
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,517,794, Cl. 57-304.000.
Noguchi, Koji; Asanae, Masumi; and Kimura, Fumio, to Hitachi Metals, Ltd. Electrophotographic developer. 4,518,673, Cl. 430-108.000.
Noguchi, Yasuhiro; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Spectrally sensitized inner latent image type silver halide photographic emulsions. 4,518,689, Cl. 430-574.000.

Nohso, Hidenori, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Stirring apparatus. 4,518,264, Cl. 366-208.000.
Nolf, Jean M. E.: *See*—
Henry, Rene H.; and Nolf, Jean M. E., 4,518,448, Cl. 156-86.000.
Nomori, Hiroyuki: *See*—
Matsuzaki, Masatoshi; Yamazaki, Toshinori; and Nomori, Hiroyuki, 4,518,670, Cl. 430-58.000.
Nonaka, Chiaki: *See*—
Higashihara, Teruaki; Nonaka, Chiaki; Yoshida, Tadao; and Kawachi, Hideo, 4,519,057, Cl. 369-50.000.
Nonnenmacher, Gerhard, to Robert Bosch GmbH. Arrangement for regulating a supply flow and for limiting a supply pressure of an adjustable pump. 4,518,322, Cl. 417-222.000.
Nordson Corporation: *See*—
Baker, Robert G., 4,518,016, Cl. 138-96.00R.
Norsk Hydro a.s.: *See*—
Storen, Harald, 4,518,438, Cl. 134-22.100.
North American Philips Corporation: *See*—
Arora, Mulk R., 4,518,471, Cl. 204-129.100.
'T Hoen, Pieter J., 4,518,889, Cl. 310-357.000.
Northern Telecom Limited: *See*—
Cote , Gerard G. M.; and Zuber, Bretislav P., 4,518,129, Cl. 242-78.000.
Lenaerts, George V.; Charchanko, Eugene W.; and Dambenieks, Andrejs, 4,517,739, Cl. 29-846.000.
Walling, Jorg-Hein; Shannon, Michael A.; and Arbuthnot, Gerald, 4,518,633, Cl. 427-120.000.
Novacor Medical Corporation: *See*—
La Forge, David H.; and Portner, Peer M., 4,519,043, Cl. 364-571.000.
Novation, Inc.: *See*—
Kessler, Bayard F., 4,518,823, Cl. 179-2.0DP.
Nozawa, Koji, to Nissan Motor Company, Limited. Clutch disc having damper springs. 4,518,071, Cl. 192-106.200.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, to Fujitsu Fanuc Limited. Numerical control system with graphical display processing of size and shape of part contour. 4,519,026, Cl. 364-167.000.
Numa, Shosaku; and Yanaihara, Noboru, to Mitsubishi Chemical Industries Limited. Polypeptides related to the pre-acetylcholine receptor-α of the electric organ of *Torpedo californica*. 4,518,527, Cl. 260-112.50R.
Nuodex Inc.: *See*—
Petronella, Joseph, 4,518,395, Cl. 44-53.000.
Oakes, Thomas R.: *See*—
Freis, Richard E.; Maloney, James E.; and Oakes, Thomas R., 4,518,459, Cl. 162-5.000.
Oates, Robert M.; Petronio, Carlo F.; and Kraus, Mark G., to Westinghouse Electric Corp. Plural sensor apparatus for monitoring turbine blading with undesired component elimination. 4,518,917, Cl. 324-207.000.
Oates, William J. Weighted exercise bar. 4,518,162, Cl. 272-93.000.
Obara, Haruki, to Fanuc Ltd. Method of controlling wire-cut electric discharge contour machines errors. 4,518,842, Cl. 219-69.00W.
Occidental Chemical Corporation: *See*—
Peterson, John A.; Saran, Mohan S.; and Wisnouskas, Joseph S., 4,518,573, Cl. 423-303.000.
Och, Rudolf, to Frenco Verzahnungslehren GmbH. Gauge. 4,517,743, Cl. 33-147.00M.
O'Connor, Robert J.: *See*—
Drexler, Leonard H.; Flynn, Richard M.; Fox, George R.; Illium, Herbert C., Jr.; and O'Connor, Robert J., 4,518,830, Cl. 179-103.000.
Oda, Kazutaka: *See*—
Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, 4,518,466, Cl. 204-28.000.
Oda, Yoshio; Morimoto, Takeshi; and Matsubara, Toshiya, to Asahi Glass Co., Ltd. Ion exchange membrane cell and electrolytic process using thereof. 4,518,470, Cl. 204-98.000.
Oefinger, Richard W.; and Babyak, Richard J., to USM Corporation. Blind rivet tool. 4,517,820, Cl. 72-391.000.
Ogasawara, Pam: *See*—
Hsia, Samson T.; and Ogasawara, Pam, 4,518,618, Cl. 426-262.000.
Ogawa, Ichitaro: *See*—
Yoshida, Hisayoshi; Ogawa, Ichitaro; Hagio, Tsuyoshi; Kobayashi, Kazuo; and Yamamoto, Takayoshi, 4,518,702, Cl. 501-90.000.
Oguma, Tomio; Hirosawa, Kouichiro; and Mitsui, Tsutomu, to Aisin Seiki Kabushikikaisha. Automatic clutch control system. 4,518,068, Cl. 192-0.052.
Oguni, Kensaku: *See*—
Atsumi, Akira; Oguni, Kensaku; Kuroda, Shigeaki; Senshu, Takao; and Yoshioka, Kazuo, 4,517,811, Cl. 62-197.000.
O'Hara, Robert J. Air damper assembly with movable blades. 4,518,012, Cl. 137-601.000.
Ohkawa, Shuji: *See*—
Taguchi, Shunichi; Ohkawa, Shuji; Watanabe, Mitsuru; and Kikuchi, Itsuo, 4,518,839, Cl. 219-10.55B.
Ohkura Electric Co., Ltd.: *See*—
Wachi, Akira; and Hayashi, Munehisa, 4,517,838, Cl. 73-204.000.
Ohlson, Kurt L. Card, especially ID-card intended retainer. 4,518,080, Cl. 206-39.000.
Ohorodnik, Alexander: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; Rosenthal, Johannes; and Schafer, Stefan, 4,518,538, Cl. 260-543.00P.
Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Method of recording pieces of image information of different kinds in electrophotography. 4,518,252, Cl. 355-133.000.
Ohyama, Hideo: *See*—
Matsui, Takeski; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, 4,519,038, Cl. 364-431.030.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,518,134, Cl. 242-199.000.
Okabayashi, Yoshikatsu; Nakamura, Noboru; Matsumoto, Takeshi; and Osumi, Yoshimasa, to Kyoto Ceramic Kabushiki Kaisha. Activated carbon formed body and method of producing the same. 4,518,704, Cl. 502-80.000.
Okada, Hisao; Tanaka, Seiichiro; and Kawaberi, Seiji, to Sony Corporation. Television signal receiving system. 4,518,993, Cl. 358-114.000.
Okamoto, Miyoshi: *See*—
Yoshida, Shusuke; Nakajima, Tamotsu; and Okamoto, Miyoshi, 4,517,715, Cl. 28-144.000.
Okamoto, Osamu: *See*—
Sekimoto, Yukihiko; and Okamoto, Osamu, 4,518,261, Cl. 366-150.000.
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Tarumi, Noriyoshi; Okamoto, Yukio; Kimura, Kiyoshi; Fukuchi, Masakazu; Miwa, Tadashi; and Ito, Kunio, 4,518,976, Cl. 346-153.100.
Okawa, Shinichi: *See*—
Shiga, Tetsuya; Okawa, Shinichi; Yoshida, Kenichi; and Hiramoto, Junichi, 4,517,982, Cl. 128-635.000.
Oki Electric Industry Co., Ltd.: *See*—
Morimoto, Etsuji; and Orito, Keijiro, 4,518,465, Cl. 204-15.000.
Sagara, Iwao, 4,518,827, Cl. 179-81.00R.
Okita, Tsutomu; and Naruo, Kyoichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium and process for producing the same. 4,518,656, Cl. 428-403.000.
Okubo, Masao; Yoshimitsu, Yasuro; Nakai, Fumio; and Garretson, Oliver R., to Japan Electronic Materials Corportion. Testing apparatus of semiconductor wafers. 4,518,914, Cl. 324-158.00F.
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, to Yamauchi Rubber Industry Co., Ltd. Magnetic rolls for electrostatic recording devices. 4,517,719, Cl. 29-124.000.
Okura, Keniti: *See*—
Nishikawa, Kazuo; Ichino, Hiroyuki; and Okura, Keniti, 4,519,063, Cl. 369-172.000.
Oldham, James A.: *See*—
Richmond, Iain J.; Wong, David; Puust, Ants; and Oldham, James A., 4,517,903, Cl. 110-233.000.
Olds, John R.; and Alt, Mark R., to Abex Corporation. Snubber for dipper door. 4,517,756, Cl. 37-118.00R.
Olin Corporation: *See*—
Eberhart, Gerald E.; and Sauls, Goah T., 4,517,716, Cl. 29-1.300.
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,518,030, Cl. 164-503.000.
Gray, Thomas J., 4,518,457, Cl. 156-656.000.
Smith, Maurice R.; and Cochran, Harvey B., 4,518,760, Cl. 528-48.000.
Olsen, R. Eric: *See*—
Bert, Jack A.; and Olsen, R. Eric, 4,517,943, Cl. 123-415.000.
Olsen, Richard E.; and Baker, Dwight C., to Digital Equipment Corporation. CPU with multi-stage mode register for defining CPU operating environment including charging its communications protocol. 4,519,028, Cl. 364-200.000.
Olson, Kenneth C., to Genentech, Inc. Purification and activity assurance of precipitated heterologous proteins. 4,518,526, Cl. 260-112.00R.
Olsson, Mats A.; and Sandstrom, Roland, to Infrasonik AB. Low-frequency sound generator. 4,517,915, Cl. 116-137.00R.
Olympus Optical Co., Ltd.: *See*—
Fukuoka, Kenji; Ida, Masatoshi; Goto, Atsuo; Akagi, Toshimasa; Imai, Masaharu; and Kimura, Kenji, 4,518,863, Cl. 250-578.000.
Mizokami, Kazunori, 4,518,237, Cl. 354-127.100.
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Nishikawa, Masaji, 4,518,248, Cl. 355-15.000.
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Onder, Kemal: *See*—
Grossman, Steven J.; and Onder, Kemal, 4,518,765, Cl. 528-314.000.
O'Neil, James W.: *See*—
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Ong, Kenneth K. H.: *See*—
Scheurer, Heinrich P.; and Ong, Kenneth K. H., 4,518,768, Cl. 528-483.000.
Ono, Mitsunori: *See*—
Yagihara, Morio; Ikegawa, Akihiko; Ono, Mitsunori; and Mihara, Yuji, 4,518,685, Cl. 430-505.000.
Onodera, Kaoru: *See*—
Sasaki, Masao; and Onodera, Kaoru, 4,518,686, Cl. 430-512.000.
Ooka, Yuzo, to Honda Giken Kogyo Kabushiki Kaisha. Clutch release apparatus for change speed transmission. 4,518,070, Cl. 192-85.0CA.
Oowa, Takeshi: *See*—
Kurihara, Teruo; and Oowa, Takeshi, 4,519,093, Cl. 378-132.000.
Oppitz, Hans, to Eltac Nogler & Daum KG. Planar heating element. 4,518,851, Cl. 219-549.000.
Optimizer, Limited: *See*—
Reinhard, George G.; Kinde, Ronald; and Singer, Bernard S., 4,517,926, Cl. 123-3.000.
Orain, Michel A., to Glaenzer Spicer. Transmission for a motor vehicle. 4,518,370, Cl. 464-113.000.
Oram, John A. Operating theatre table light. 4,519,021, Cl. 362-277.000.
Orbisphere Corporation Wilmington: *See*—
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Orito, Keijiro: *See—*
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Ormesher, Robert J., to Aluminum Company of America. Metal scrap reclamation system. 4,518,424, Cl. 75-65.00R.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See—*
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Osaka Soda Co. Ltd.: *See—*
Tanaka, Motomu; Osuka, Masanari; Kuri, Takeshi; and Takakuwa, Sadao, 4,518,764, Cl. 528-271.000.
Osaka, Takatoshi; Nishimura, Katsuo; and Nakagiri, Tadahiko, to Citizen Watch Co., Ltd. Ball throwing machine. 4,517,953, Cl. 124-17.000.
Osato, Yoichi: *See—*
Misumi, Teruo; and Osato, Yoichi, 4,518,671, Cl. 430-84.000.
Oshikawa, Yoshihiro, to Fujitsu Limited. Method for fabricating an EEPROM. 4,517,732, Cl. 29-571.000.
Osman, Robert M.; and Shulik, Larry J., to Exxon Research & Engineering Co. Catalytic gas synthesis process. 4,518,574, Cl. 423-360.000.
Osuka, Masanari: *See—*
Tanaka, Motomu; Osuka, Masanari; Kuri, Takeshi; and Takakuwa, Sadao, 4,518,764, Cl. 528-271.000.
Osumi, Yoshimasa: *See—*
Okabayashi, Yoshikatsu; Nakamura, Noboru; Matsumoto, Takeshi; and Osumi, Yoshimasa, 4,518,704, Cl. 502-80.000.
Oswald, Richard A.: *See—*
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Ota, Takahiro: *See—*
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Otaka, Shoichi; Kondo, Yukio; Kumada, Masayuki; Kawamoto, Hideyo; and Miura, Keiji, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold apparatus in multi-cylinder engine. 4,517,951, Cl. 123-572.000.
Otani, Tadahiko: *See—*
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Othuka, Kazutoshi: *See—*
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Otstot, Roger S.; and Runkle, Charles J., to Monsanto Company. Method of mounting a fluid separation module in a tubular shell. 4,517,720, Cl. 29-157.00R.
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Moulding compositions of vinyl chloride polymers, graft polymers and polymeric plasticizers having a high resistance to ageing. 4,518,515, Cl. 525-79.000.
Ott, Karl-Heinz: *See—*
Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,743, Cl. 525-80.000.
Otto Bihler Maschinenfabrik GmbH & Co. KG: *See—*
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Otto, Josef: *See—*
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Otto, Ronald F.; and Kempel, John J., to Garland Manufacturing Co. Energy efficient garage door construction and the like. 4,518,026, Cl. 160-232.000.
Ottoson, Ulf: *See—*
Boysen, Lennart; and Ottoson, Ulf, 4,518,125, Cl. 241-141.000.
Oudet, Claude, to Portescap. Electric motor with permanent magnet rotor. 4,518,883, Cl. 310-49.00R.
Outboard Marine Corporation: *See—*
Bland, Gerald F.; and Sullivan, Donald K., 4,518,363, Cl. 440-89.000.
Johnson, Wallace R.; and Beem, W. Wayne, 4,518,362, Cl. 440-6.000.
Overland, John E.: *See—*
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.
Owen, David P., to Marconi Instruments, Ltd. Frequency synthesizer having overtone crystal oscillator. 4,518,929, Cl. 331-11.000.
Owens-Corning Fiberglas Corporation: *See—*
Bhatti, Mohinder S., 4,518,408, Cl. 65-6.000.
Perkins, Richard A.; Brady, William C.; and Glaser, Hellmut I., 4,518,406, Cl. 65-1.000.
Uffner, William E.; and White, Robert N., 4,518,741, Cl. 525-54.500.
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, to Hitachi, Ltd. Air flow rate measuring apparatus. 4,517,837, Cl. 73-202.000.
Ozawa, Junichiro: *See—*
Nakahori, Ichiro; Nakayama, Shigeki; Maeda, Mitsuo; Yamauchi, Shiro; and Ozawa, Junichiro, 4,517,849, Cl. 73-863.310.
Ozu, Tadahiro: *See—*
Nakano, Hideaki; Ozu, Tadahiro; and Shirai, Eiichi, 4,517,930, Cl. 123-41.310.
P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG: *See—*
Wahlmann, Ernst; and Klausing, Karl-Heinz, 4,518,201, Cl. 297-316.000.
Pace, Gerald F.; and Cantu, Terry S., to Conoco Inc. Coal based cement cover for coal pile. 4,518,393, Cl. 44-6.000.
Pacheco, Benjamin G.: *See—*
Valdes, Guillermo A.; Pacheco, Benjamin G.; Figueredo, Fernando F.; and Framil, Armando, 4,518,022, Cl. 30-166.00R.
Paelke, Jurgen. Bend unit for a belt conveyor. 4,518,079, Cl. 198-864.000.
Palmer, Tom, to Key Systems, Inc. Animal feeding system. 4,517,923, Cl. 119-51.00R.
Papez, Stanislav, to Volkswagenwerk Aktiengesellschaft. Controllable camshaft for a drive, preferably an internal combustion engine. 4,517,934, Cl. 123-90.170.
Papst, Georg: *See—*
Elsaesser, Dieter; von der Heide, Johann; Muller, Rolf; and Papst, Georg, 4,519,010, Cl. 360-97.000.
Papst-Motoren GmbH & Co. KG: *See—*
Elsaesser, Dieter; von der Heide, Johann; Muller, Rolf; and Papst, Georg, 4,519,010, Cl. 360-97.000.
Paranicas, Peter C., to LVC Industries, Inc. Matrix slide switch. 4,518,834, Cl. 200-16.00D.
Parisch, Jochen: *See—*
Gallitzendorfer, Joseph; Pfeiffer, Peter; Tomforde, Johann; Parisch, Jochen; and Zweigart, Gerhard, 4,518,197, Cl. 296-213.000.
Park, Dong-Sil; and Zabala, Robert J., to Electric Power Research Institute, Inc. Process of making a corrosion-resistant coated ferrous body. 4,518,624, Cl. 427-34.000.
Park, Kwang S., to Daewoo Heavy Industries Ltd. Automatic notching device in a sewing machine. 4,517,908, Cl. 112-129.000.
Parker, Dennis W., to Dowty Hydraulic Units Limited. Electro-hydraulic servo valves and electrical force motors suitable therefor. 4,518,937, Cl. 335-229.000.
Parkin, Robert L. Ceiling mounting assembly. 4,518,141, Cl. 248-546.000.
Parkinson, Richard W., to Redken Laboratories, Inc. Cosmetic preparation. 4,518,614, Cl. 514-2.000.
Parris, Joe P., III: *See—*
Vicic, John C.; La Velle, Carl A.; and Parris, Joe P., III, 4,518,144, Cl. 251-1.00A.
Partridge, Randall D.: *See—*
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Stephen S., 4,518,485, Cl. 208-89.000.
Pasarela, Nunzio R., to American Cyanamid Company. Expanded corncob grits having increased absorptivity and a method for the preparation thereof. 4,518,580, Cl. 424-16.000.
Passoni, Mario, to Passoni Paolo & Figli S.r.l. Modular assembly-type stand structure particularly for supporting storage batteries. 4,518,088, Cl. 211-13.000.
Passoni Paolo & Figli S.r.l.: *See—*
Passoni, Mario, 4,518,088, Cl. 211-13.000.
Pastien, Eugene R., to Smarte Carte, Inc. Vehicle lock apparatus and method. 4,518,073, Cl. 194-4.00C.
Pastien, Eugene R.: *See—*
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Paul, Volker: *See—*
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,518,600, Cl. 514-256.000.
Paul Wurth S.A.: *See—*
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Paust, Joachim: *See—*
Ernst, Hansgeorg; Vogel, Friedrich; and Paust, Joachim, 4,518,813, Cl. 570-241.000.
Pearson, Herby O.: *See—*
Fister, Louis P.; Pearson, Herby O.; and Fitch, Lawrence H., 4,518,058, Cl. 180-300.000.
Pearson, Walter C.; and Thompson, Dorman N., Jr., to Minnesota Mining and Manufacturing Company. Apparatus for binding sheets together. 4,518,296, Cl. 412-37.000.
Pecenka, Frank, to Cordis Corporation. Detachable balloon catheter. 4,517,979, Cl. 128-325.000.
Pechine Ugine Kuhlmann: *See—*
Perrot, Michel; and Jaccaud, Michel, 4,518,569, Cl. 423-19.000.
Pecorini, Claude. Device for remotely passing a cord in or around an anchoring member. 4,518,184, Cl. 294-19.100.
Pedain, Josef: *See—*
Breidenbach, Peter; Hurnik, Helmut; and Pedain, Josef, 4,518,729, Cl. 524-101.000.
Pedersen, Jack R.; and Ege, Sigmund, to International Standard Electric Corporation. Method for making electrical cables. 4,518,445, Cl. 156-49.000.
Pedersen, Svend P.: *See—*
Andresen, Erik E.; and Pedersen, Svend P., 4,518,147, Cl. 251-121.000.
Pellegri, Alberto, to Oronzio deNora Impianti Elettrochimici S.p.A. Electrolyzer and process. 4,518,113, Cl. 228-170.000.
Pellet, Regis J., to Standard Oil Company (Indiana). Dual particle hydrotreating catalyst. 4,518,709, Cl. 502-254.000.
Pelletier, Robert: *See—*
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,518,811, Cl. 368-943.000.
Pelley, Ronald L. Inflation supported solar collector. 4,517,957, Cl. 126-426.000.

Pennwalt Corporation: *See*—
Griffith, Ronald C., 4,518,779, Cl. 546-144.000.
Penny, Michael F.; Woodcock, Brian; Abbot, Ralph H.; Phillips, David M.; and Spaans, Leendert B., to Commonwealth of Australia, The. Ocean depth sounding from the air by laser beam. 4,518,254, Cl. 356-5.000.
Penterson, Craig A.; and Langille, Donald S., to Riley Stoker Corporation. Furnace, burner and method for burning pulverized coal. 4,517,904, Cl. 110-264.000.
Peretti, Mark F., to Barry Wright Corporation. Coupling. 4,518,368, Cl. 464-70.000.
Perkins Research & Mfg. Co., Inc.: *See*—
Cass, James L., 4,518,911, Cl. 324-52.000.
Perkins, Richard A.; Brady, William C.; and Glaser, Hellmut I., to Owens-Corning Fiberglas Corporation. Drain bushing. 4,518,406, Cl. 65-1.000.
Perl, Martin M.: *See*—
Schamper, Thomas J.; Perl, Martin M.; and Warren, James D., 4,518,582, Cl. 424-66.000.
Perlin, Alfred R., to Kendall Company, The. Esophageal probe. 4,517,984, Cl. 128-642.000.
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, to Centre Technique de L'Industrie des Papiers, Cartons et Celluloses. Apparatus for fractionating solid particles suspended in a liquid. 4,518,499, Cl. 210-332.000.
Perrot, Michel; and Jaccaud, Michel, to Pechine Ugine Kuhlmann. Process for cleaning the inner walls of a reactor. 4,518,569, Cl. 423-19.000.
Persinko, Mark M.: *See*—
Wang, Robert C.; Sampson, Arthur J.; and Persinko, Mark M., 4,518,649, Cl. 428-284.000.
Personal Products Company: *See*—
Luceri, Thomas J.; and Molee, Kenneth J., 4,518,451, Cl. 156-202.000.
Peruzzi, Federigo; and Zgliczynski, Marek, to Aspera A.p.A. Hermetic motor compressor for refrigeration systems and the like. 4,518,326, Cl. 417-372.000.
Peters, David L.: *See*—
Fisher, Robert A.; and Peters, David L., 4,518,360, Cl. 434-20.000.
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., to Sundstrand Data Control, Inc. Accelerometer with beam resonator force transducer. 4,517,841, Cl. 73-517.0AV.
Peterson, Bruce W.: *See*—
Cuscurida, Michael; Waddill, Harold G.; and Peterson, Bruce W., 4,518,720, Cl. 521-156.000.
Peterson, John A.; Saran, Mohan S.; and Wisnouskas, Joseph S., to Occidental Chemical Corporation. Differential flotation reagent and method of preparation. 4,518,573, Cl. 423-303.000.
Peterson, Richard L.; and Scheurer, Roger J., to Hiniker Company. Tool bar with slidably insertable ballast block. 4,518,047, Cl. 172-611.000.
Peterson, William F.: *See*—
Murphy, Frank; and Peterson, William F., 4,518,387, Cl. 604-187.000.
Petr, David W., to AT&T Bell Laboratories. Digital code converter. 4,518,950, Cl. 340-347.0DD.
Petricka, Ronald E., to Deluxe Innovations, Inc. Paint roller cleaning apparatus. 4,517,699, Cl. 15-104.040.
Petrolite Corporation: *See*—
Newberry, Michael E., 4,518,509, Cl. 252-8.300.
Petronella, Joseph, to Nuodex Inc. Process for the stabilization of metal-containing hydrocarbon fuel compositions. 4,518,395, Cl. 44-53.000.
Petronio, Carlo F.: *See*—
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Pettit, Flora H., executrix: *See*—
Kramer, George M.; Weissman, Walter; Brown, Herbert C.; and Pettit, Rowland, deceased, 4,518,798, Cl. 560-233.000.
Pettit, Rowland, deceased: *See*—
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Phillips, Larry J.: *See*—
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Knudsen, Ronald D.; and Reiter, Stephen E., 4,518,814, Cl. 585-523.000.
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Phillips, Raymond M. Motion damping system for water bed mattresses. 4,517,691, Cl. 5-450.000.
Phillips, Stephen J., to Coca-Cola Limited. Game cup with game information under the rolled lip. 4,518,639, Cl. 428-35.000.
Phillips, William L., Jr., to Du Pont de Nemours, E. I., and Company. Method for passivating stainless steel surfaces and product thereof. 4,518,440, Cl. 148-6.14R.
Pickering, Alan H., to English Electric Valve Company, Ltd. Coaxial magnetron having cavity walls vibrated by tuning fork. 4,518,932, Cl. 331-90.000.
Pickering, William: *See*—
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Pierce, Harry C.; and Bailey, Helen A. B. Device for loosening a cable within a conduit. 4,518,152, Cl. 254-134.30R.
Pierschbacher, Michael D.: *See*—
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Pietrasanta, Yves: *See*—
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Pirkey, Robert J.; and Ditter, Stephen D., to Tecumseh Products Company. Override speed control. 4,517,942, Cl. 123-376.000.
Pistien, Jacques F., to Gaz de France. Gas fuel burner with incorporated ignition and safety devices. 4,518,346, Cl. 431-266.000.
Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Process for isolating paraffinsulfonate from the reaction mixture obtained on sulfoxidating paraffins. 4,518,537, Cl. 260-504.00R.
Pitney Bowes Inc.: *See*—
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Pollard, Robert E., to Monsanto Company. Carbon black filled nylons modified for improved toughness. 4,518,728, Cl. 524-88.000.
Pomfret, Colin T. Device for transmitting movement. 4,517,935, Cl. 123-90.400.
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Poston, Billy R.; and Andren, Carl F., to E-Systems, Inc. Apparatus for decoding redundant interleaved data. 4,518,947, Cl. 340-347.0DD.
Powell, Steven. Fluid damping device for a compliant system. 4,517,844, Cl. 73-707.000.
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Rasmussen, Oystein. Method for the protection of ships and other objects against fouling. 4,518,638, Cl. 427-407.100.
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Rauscher, Christen. Transistor oscillator/frequency doubler with optimized harmonic feedback. 4,518,931, Cl. 331-76.000.
Ravinet, Pierre; and Micheron, Francois, to Thomson-CSF. Manufacturing an active suspension electromechanical transducer. 4,518,555, Cl. 264-292.000.
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Rentchler, Frances A.: *See—*
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Locatelli, Jean L.; and Rollet, Bernard, 4,518,755, Cl. 526-262.000.

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Richards, David H.; and Stewart, Malcolm J., to National Research Development Corporation. Anionic polymerization of conjugated dienes in the presence of hindered triaryl boron or aluminum derivatives. 4,518,753, Cl. 526-177.000.

Richards, Michael A., to S. G. Owen Limited. Selective plating. 4,518,636, Cl. 427-282.000.

Richards, William D. C.; and Straub, Harry, to General Electric Co. Tubular assembly including insulated conduits and couplers for the transfer of high temperature and high pressure fluids. 4,518,175, Cl. 285-47.000.

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Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Riberi, Bernd; and Frohlich, Jurg, to Bayer Aktiengesellschaft. Process for the preparation of mixed trimers from organic isocyanates, the mixed trimers obtained according to the process and the use thereof for the production of polyurethanes. 4,518,761, Cl. 528-67.000.

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Rivers, Joseph T.: *See—*
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Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. GRF Analogs III. 4,518,586, Cl. 514-12.000.

Robbins, John C.: *See—*
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Robbins, Murray: *See—*
NG, Sau-Lan L.; Plewes, John T.; and Robbins, Murray, 4,518,469, Cl. 204-44.500.

Robert, Andre, to Commissariat a l'Energie Atomique. Lightning conductor with piezoelectric device for initiating the corona effect. 4,518,816, Cl. 174-3.000.

Robert Bosch GmbH: *See—*
Kuhlmann, Gerhard; and Wolf, Erwin, 4,517,869, Cl. 83-100.000.
Nonnenmacher, Gerhard, 4,518,322, Cl. 417-222.000.
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Robert F. Varley Co., Inc.: *See—*
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Roberts, Thomas G., to United States of America, Army. Porous catalytic metal plate degeneration bed in a gas generator. 4,517,798, Cl. 60-39.462.

Robey, Robert M.: *See—*
Gillett, James E.; Garner, Daniel C.; Wineman, Arthur L.; and Robey, Robert M., 4,517,927, Cl. 122-510.000.

Robinson, Philip R., to Allegheny Ludlum Steel Corporation. Metering system for corrosive liquids and method therefor. 4,518,101, Cl. 222-1.000.

Roccaforte, Harry L., to Champion International Corporation. Reinforced display carton and blank therefor. 4,518,086, Cl. 206-485.000.

Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Dr. Karl Thomae GmbH. Antithrombotic use of 2-(perhydro-1,4-diazino)-pyrimido (5,4,D)-pyrimidines. 4,518,596, Cl. 514-232.000.

Roch, Josef: *See—*
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.

Rockwell International Corporation: *See—*
Fechalos, William A.; and DeMarco, Joseph M., 4,519,072, Cl. 370-110.100.
Fredrickson, Lee R.; Cascini, Michael R.; and Mosier, Donald E., 4,518,225, Cl. 350-338.000.
Rhodes, William D., Jr., 4,518,905, Cl. 318-661.000.
Rozema, John G.; and Chen, William I. H., 4,518,930, Cl. 331-36.00C.

Rodime plc: *See—*
MacLeod, Nigel; and Ruxton, David, 4,518,904, Cl. 318-685.000.

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Benjamin, Lawrence; Rodriguez, Sheila S.; and Meinberg, Nancy A., 4,517,919, Cl. 119-1.000

Rody, Jean: See—
Leppard, David G.; and Rody, Jean, 4,518,679, Cl. 430-372.000
Leppard, David G.; and Rody, Jean, 4,518,688, Cl. 430-551.000

Rogers Corporation: See—
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Rogers, Curtis F., Jr. Automatic indicator for tower lights. 4,518,963, Cl. 340-981.000.

Rogers, Harold D.: See—
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Rogers, Jerry L. Carburetor attachment. 4,518,542, Cl. 261-34.00R.

Rogic, Milorad M.: See—
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Rohner, Joachim, to W. Schlafhorst & Co. Device for collecting spools. 4,518,136, Cl. 242-35.50A.

Rohr, Wolfgang: See—
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Rohk, Juri K.: See—
Kaiser, Karl R.; Sjold, Teye-Maye F.; Kristyanson, Peep G.; Kholm, Gunnar B.; Rohk, Juri K.; and Post, Kalju M., 4,518,453, Cl. 156-307.500.

Rolland, Gerard T., to SSAC, Inc. Electronic toaster timer with preceding off-time temperature control compensation. 4,518,849, Cl. 219-492.000.

Rollet, Bernard: See—
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Locatelli, Jean L.; and Rollet, Bernard, 4,518,755, Cl. 526-262.000.

Roman, Steven A., to Shell Oil Company. Cyclopropanecarboxylate pesticides and their preparation. 4,518,797, Cl. 560-231.000.

Ronco, Kenneth J.; Sommer, Robert; Nigel, Ken; Grimes, Donald; Zirbes, James A.; and Stacey, Robert E., to Rexnord Inc. Polymeric snap-through attachment for a hollow rivet chain. 4,518,077, Cl. 198-731.000.

Rondeau, Donald J.: See—
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Rosenbaum, Leslie; and Alberts, Robert. Shoe. 4,517,753, Cl. 36-128.000.

Rosenberg, Harold; and Tsai, Tse-tze, to United States of America, Air Force. Synthesis of acylene siloxanylene polymers and copolymers. 4,518,759, Cl. 528-35.000.

Rosenthal, Johannes: See—
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Ross, Steven L.; and Tachovsky, Otto H., to General Signal Corporation. Anaotropic drying process. 4,517,751, Cl. 34-10.000.

Roth, Wolfgang, to Deere & Company. Self tensioning belt drive. 4,518,373, Cl. 474-109.000.

Rothenhofer, Sven O., to Frigoscandia Contracting AB. Apparatus for continuous direct treatment of products by means of a fluid cooling medium. 4,517,814, Cl. 62-374.000.

Rott, Willi: See—
Lamertz, Rudiger; Rott, Willi; and Siedorf, Heinz, 4,518,501, Cl. 210-611.000.

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Allais, Andre; Clemence, Francois; Durrueh, Roger; and Lemartret, Odile, 4,518,773, Cl. 544-92.000.

Rowy, Noel; and Dewilde, Francois, to Rhone-Poulenc Agrochimie. Process for the preparation of 3-hydroxymethyl chlorobenzoxazolone. 4,518,781, Cl. 548-221.000.

Rova, Jan-Erik. Device in a bucket-provided loading machine particularly a so-called wheel loader. 4,518,306, Cl. 414-724.000.

Rowland, David B. Car dome light with accessory. 4,519,018, Cl. 362-74.000.

Roymoore Limited: See—
Hart, Reginald J.; 4,518,549, Cl. 264-39.000.

Rozema, John O.; and Chen, William I. H., to Rockwell International Corporation. Negative resistance circuit for VCO. 4,518,930, Cl. 331-36.00C.

Rozsell, J. David, to Genetics Institute, Inc. Production of L-amino acids by transamination. 4,518,692, Cl. 435-116.000.

Rubin, Jacob D., to Eastman Kodak Company. Method of passivating aluminum interconnects of non-hermetically sealed integrated circuit semiconductor devices. 4,517,734, Cl. 29-577.00C.

Rucker, Klaus O., to Du Pont de Nemours, E. I., and Company. Electric initiator resistant to actuation by radio frequency and electrostatic energies. 4,517,893, Cl. 102-202.200.

Rudolf, Peter: See—
Takacs, Istvan; Karvy, Gyorgy; Illes, Janos; Rudolf, Peter; Gara, Pal; Csuhe, Laszlo; and Neuzsely, Ernebet, 4,518,771, Cl. 536-21.000.

Rudolph, Ronald M.; and Wendl, Daniel P. Measuring bridge for determining motor vehicle damage. 4,517,748, Cl. 33-180.0AT.

Rumble, Clive R., to Corubelement A.G. Multiple pin electrical plug. 4,518,212, Cl. 339-31.00R.

Rundel Products, Inc.: See—
Rauch, Lloyd D., III; and Schneberger, Ronald W., 4,518,273, Cl. 402-80.000.

Runkel, Manfred A.: See—
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Runkle, Charles J.: See—
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Rus'akhin, Erikh I.; and Pierrichubchev, Michael D., to La Jolla Cancer Research Foundation Polypeptide. 4,517,686, Cl. 3-1.000

Rusakova, Svetlana V.; Glyzin, Vladimir I.; Kocherga, Stepan I.; Anonova, Alla A.; and Lukanova Larisa F. Process for preparing mangafenn. 4,518,592, Cl. 424-195.100

Rust-Oleum Corporation: See—
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Ruzicka, David: See—
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S.E.R.T.O.G.: See—
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S. G. Owen Limited: See—
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S. W. Hart & Co. Pty Ltd.: See—
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Fauvel, Andre; Menuel, Gabriel B.; and Michaux, Jacques M., 4,518,860, Cl. 428-577.000.

Sackner, Marvin A.; and Kou, Chong S. Method for measurement of neuromuscular acrosol retained in the lungs with rebreathing. 4,517,987, Cl. 128-719.000.

SACMI Cooperativa Meccanici Imola Soc. Coop. a Resp. Lim.: See—
Alteri, Roberto, 4,518,336, Cl. 425-110.000.

Sadowa, Henri, to Societe d'Etude du Radout. Adaptive spatial microwave filter for multiplexed antennas and the process of its application. 4,518,966, Cl. 343-754.000.

Sargusa, Yasuyoshi, to Sasimoto Electric Industries, Ltd. Oil pump. 4,518,332, Cl. 418-150.000.

Sagal, John: See—
Henry, Arnold W.; Azar, Jack C.; and Sagal, John, 4,518,455, Cl. 428-329.000.

Sagara, Iwao, to Oki Electric Industry Co., Ltd. Telephone answering and message recording system. 4,518,827, Cl. 179-81.00R.

Sasso, Edmond, to Beecham Group Limited. Pharmaceutical compositions. 4,518,606, Cl. 514-197.000.

Saitoh, Hiroyuki; and Kurata, Masami, to Fuji Xerox Co., Ltd. Three-color copying machine. 4,518,987, Cl. 358-75.000.

Saitoh, Hiroyuki; and Kurata, Masami, to Fuji Xerox Co., Ltd. Two-color copying machine. 4,518,988, Cl. 358-75.000.

Saitoh, Hiroyuki: See—
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Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Kenki, to Murata Kikai Kabushiki Kaisha. Method of guiding yarn end in air spinning apparatus. 4,517,794, Cl. 57-304.000.

Sakai, Toshihide: See—
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Sakamoto, Shunichi: See—
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Salk Institute for Biological Studies, The: See—
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Samson Holding Corporation: See—
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Sampson, Arthur J.: See—
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Sanders Associates, Inc.: See—
Gunderson, Charles; and Hammond, Henry W., 4,518,972, Cl. 346-139.00R.
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Sandford, Donald L.: See—
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Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshiharu; and Ishidoshiro, Hiroshi, 4,517,818, Cl. 68-5.00E.

Sando, Yoshiharu, and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. High pressure steamer for continuous wet-heat treatment of a cloth. 4,517,818, Cl. 68-5.00E.

Sandoz Ltd.: *See*—
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Sandroni, Ossani, to Caterpillar Tractor Co. Method and apparatus for forging sprocket segments. 4,517,819, Cl. 72-353.000.

Sandstrom, Roland: *See*—
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Takayama, Hidetaro, 4,518,340, Cl. 261-18.00B.

Santalucia, Andre R.: *See*—
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Santefort, Richard A., to Valco Cincinnati, Inc. Blow-off manifold for preventing trailing from a non-contact extrusion adhesive application valve. 4,517,917, Cl. 118-302.000.

Santopietro, Frank J.; and Santopietro, Thomas V., Jr.. Orthotic device. 4,517,981, Cl. 128-581.000.

Santopietro, Thomas V., Jr.: *See*—
Santopietro, Frank J.; and Santopietro, Thomas V., Jr., 4,517,981, Cl. 128-581.000.

Saras, Mohan S.: *See*—
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Sasaki, Masao; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Color photographic light-sensitive material containing UV filter compounds. 4,518,686, Cl. 430-512.000.

Sasayama, Takao: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.

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Sato, Kanemasa: *See*—
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Sato, Yutaka: *See*—
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Sauls, Gosh T.: *See*—
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Schaefer, George F.: *See*—
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Schafer, Heinrich, to Battenfeld Extrusionstechnik GmbH. Drive for single-worm extruder. 4,517,838, Cl. 74-801.000.

Schafer, Helmut; Heckler, Volker; and Teich, Michael, to Deere & Company. Power take-off lever arrangement for a tractor. 4,517,854, Cl. 74-528.000.

Schafer, Stefan: *See*—
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Schamper, Thomas J.; Perl, Martin M.; and Warren, James D., to American Cyanamid Company. Acid stable dibenzyl monosorbitol acetal gels. 4,518,382, Cl. 424-66.000.

Schartz, Vern R., to AMPTT, Inc. System and method for forming custom-made shoe inserts. 4,517,696, Cl. 12-1.00R.

Scheffers, Richard W., to Bigsode Corporation. Mechanism for filling bags of different sizes. 4,517,788, Cl. 53-459.000.

Scheurenbrand, Dieter; Stotz, Manfred; Dietel, Manfred; and Kleinschmit, Rinhard, to Daimler-Benz Aktiengesellschaft. Motor vehicle fuel tank. 4,518,091, Cl. 220-3.00A.

Scheurer, Heinrich P.; and Ong, Kenneth K. H., to Warner-Lambert Company. Removal of benzene from carbosy polymethylene resin. 4,518,760, Cl. 528-483.000.

Scheurer, Roger J.: *See*—
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Schindel GmbH & Co.: *See*—
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Schiemann, Wolfram. Device for fuel tanks for cars. 4,518,009, Cl. 137-571.000.

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Schindler, Joachim: *See*—
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Schindler, Wolfgang: *See*—
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Schinner, Edward N.: *See*—
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Schirmer, Ulrich; Plath, Peter; and Wuerser, Bruno, to BASF Aktiengesellschaft. Thiadiazole derivatives and their use for controlling undesirable plant growth. 4,518,414, Cl. 71-90.000.

Schlupp, Ronald L., to Advanced Micro Devices, Inc. Merged platinum silicide fuse and Schottky diode and method of manufacture thereof. 4,518,981, Cl. 357-71.000.

Schmid, Rolf: *See*—
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Schmidt, Robert R.: *See*—
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Schmidt, Timothy J., to General Safety Corporation. Combination seat belt retractor mechanism. 4,518,132, Cl. 242-107.40A.

Schmitt, Peter D.: *See*—
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Schmitz, Gerd: *See*—
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Schneberger, Ronald W.: *See*—
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Schnedecker, Guy; and Mougin, Jacques, to Commissariat a l'Energie Atomique. Process for sealing at least one end of a cellular module. 4,518,635, Cl. 427-232.000.

Schneider, Irwin, to United States of America, Navy. Color center laser, material, and method of lasing. 4,519,082, Cl. 372-42.000.

Schniederjan, Reinhold, to Hydromatik GmbH. Power regulation device for a hydraulic pump. 4,518,321, Cl. 417-218.000.

Schnitzler, Paul, to RCA Corporation. Communication system compandor. 4,518,994, Cl. 358-133.000.

Schoenagel, Hans J.: *See*—
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Scholz, Gerhard, to Licentia Patent-Verwaltungs-GmbH. Video recorder including a plurality of operating elements. 4,519,003, Cl. 358-335.000.

Schouteeten, Alain; and Christidis, Yani, to Societe Francaise Hoechst. Process for preparation of crystallized monohydrated sodium phenylpyruvate. 4,518,800, Cl. 562-459.000.

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Schudlich, Kurt; Vielstich, Gunter; Muhlenbeck, Josef; Otto, Josef; Bauer, Hannegeorg; Zollner, Dieter H.; and Rittmann, Friedrich, to ARC Technologies Systems, Ltd. Device for nippling active electrode sections onto a combination electrode. 4,518,345, Cl. 445-67.000.

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Schultz, Charles R. Decorative fan motor cover and mounting structure therefor. 4,518,314, Cl. 416-93.00R.

Schulz, Donald N.; Kitano, Kisho; Burkhardt, Terry J.; and Langer, Arthur W., to Exxon Research & Engineering Co. Drag reduction agent for hydrocarbon liquid. 4,518,757, Cl. 526-329.000.

Schulz, Peter: *See*—
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Schulze, Ehrhart; and Bochler, Franz, to Stiegler, Karl Heinz. Apparatus for the manufacture of plastic bags. 4,518,378, Cl. 493-204.000.

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Schuster, Max, to Zahnradfabrik Friedrichshafen AG. Axle drive mechanism. 4,518,045, Cl. 192-4.00A.

Schutt, John B.; and Shai, Michael C., to United States of America, National Aeronautics and Space Administration. Diffusely reflecting paints including polytetrafluoroethylene and method of manufacture. 4,518,722, Cl. 523-135.000.

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Schwam, Bill R.: *See*—
Sneed, Scott W.; Schwam, Bill R.; and Gregory, Paul E., Jr., 4,517,714, Cl. 28-103.000.
Schwartz, Jacob, to Sanders Associates, Inc. Enhanced accuracy optical radar. 4,518,256, Cl. 356-5.000.
Schwarzhoff, Wolfgang, to Robert Bosch GmbH. Multi-pole electric plug. 4,518,215, Cl. 339-92.00R.
Schweighardt, Frank; Hoover, David S.; and Garg, Diwaker, to International Coal Refining Company. Time phased alternate blending of feed coals for liquefaction. 4,518,479, Cl. 208-8.01.E.
Schweizerische Eidgenossenschaft, Vertreten Durch Die Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustungsdienste: *See*—
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Scotto, Dominick P., to Sperry Corporation. Stable plumb beam optical projector. 4,517,749, Cl. 33-346.000.
Seelmayr, Gerhard, to Autoflug GmbH. Apparatus for adjusting the height of the fixing or guide fitting for the shoulder belt of a safety belt system. 4,518,174, Cl. 280-808.000.
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Stoetzer, Steven R., to Acheson Industries, Inc. Silver coating composition for use in electronic applications and the like. 4,518,524, Cl. 252-514.000.
Stoll, Kurt. Control valve unit for the cylinder of a fluid actuator. 4,518,011, Cl. 137-596.170.
Storage Technology Corporation: *See*—
Komonytsky, Donald, 4,519,078, Cl. 371-25.000.
Storen, Harald, to Norsk Hydro a.s. Method of transport, cooling and compression of nitrogen oxide-containing gases. 4,518,438, Cl. 134-22.100.
Stotz, Manfred: *See*—
Scheurenbrand, Dieter; Stotz, Manfred; Distel, Manfred; and Kleinschmit, Einhard, 4,518,091, Cl. 220-5.00A.
Stoudt, Michael D.: *See*—
Spitzner, Jerome G.; and Stoudt, Michael D., 4,518,246, Cl. 355-4.000.
Stouffer, Ronald D., to Bowles Fluidics Corporation. Sweeping air stream apparatus and method. 4,517,881, Cl. 98-208.000.
Strachan, Bruce D.: *See*—
Holland, Scott B.; Greene, Edward S.; Kowalski, David A.; and Strachan, Bruce D., 4,517,832, Cl. 73-118.000.
Strahle, Fritz: *See*—
Muchel, Franz; and Strahle, Fritz, 4,518,231, Cl. 350-516.000.
Straub, Harry: *See*—
Richards, William D. C.; and Straub, Harry, 4,518,175, Cl. 285-47.000.
Straw, Timothy B.: *See*—
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.
Stuhrmann, Heinz, to Deere & Company. Vehicle-mounted apparatus for supporting ballast weights and for elevating the weights. 4,518,305, Cl. 414-719.000.
Stupak, Joseph J., Jr., to Ibis Systems, Inc. Linear motor. 4,518,881, Cl. 310-13.000.
Stutenkemper, Paul; Rest, Heinz; and Kloppe, Herbert, to Ford Motor Company. Fastening device. 4,518,138, Cl. 248-73.000.
Suffa, Hilmar, to Dorst Maschinen-und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel & Co. Press for manufacturing plates, etc. 4,518,341, Cl. 425-405.00H.
Suganuma, Tetsuya; and Kazuoka, Koji, to Toyota Jidosha Kabushiki Kaisha. Method for manufacturing a slide member. 4,518,563, Cl. 419-29.000.
Sugawara, Koko: *See*—
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,518,589, Cl. 514-27.000.
Sugie, Mamoru: *See*—
Toyooka, Takashi; Aoki, Hirokazu; and Sugie, Mamoru, 4,519,049, Cl. 365-12.000.
Sugie, Masatoshi, to Ricoh Company, Ltd. Facsimile communication method with anti-echo strategy. 4,519,081, Cl. 371-57.000.
Sugimori, Masahiro: *See*—
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Sugimori, Masahiro, 4,518,472, Cl. 204-159.150.
Sugimoto, Hiroyuki: *See*—
Fujita, Kazunori; Nishimura, Shigeoki; Sugimoto, Hiroyuki; Ebato, Noboru; and Matsuda, Shinpei, 4,518,665, Cl. 429-153.000.
Sugiura, Muneharu, to Canon Kabushiki Kaisha. Zoom lens. 4,518,228, Cl. 350-427.000.
Sugiyama, Hiroyuki, to Victor Company of Japan, Limited. Signal pickup device. 4,519,062, Cl. 369-126.000.
Sui, Akira: *See*—
Yokoshima, Naohiko; Masumoto, Nobuyoshi; and Sui, Akira, 4,517,726, Cl. 29-527.400.
Sulcek, Charles E.; and Miller, Frank E., to Whirlpool Corporation. Support and leveling system for refuse compactor. 4,518,142, Cl. 248-649.000.
Sulcon, Inc.: *See*—
Yarbrough, Roger L., 4,518,548, Cl. 264-32.000.
Sullivan, Donald K.: *See*—
Bland, Gerald F.; and Sullivan, Donald K., 4,518,363, Cl. 440-89.000.
Sulzer Brothers Limited: *See*—
Hintsch, Otto; and Schmitz, Gerd, 4,518,019, Cl. 139-1.00R.
Sulzle, Walther, to Sulzle, Wilhelm. Apparatus for securing connectors to a fabric. 4,517,737, Cl. 29-798.000.
Sulzle, Wilhelm: *See*—
Sulzle, Walther, 4,517,737, Cl. 29-798.000.
Sumimoto Electric Industries, Ltd.: *See*—
Saegusa, Yasuyoshi, 4,518,332, Cl. 418-150.000.
Sumitomo Chemical Company, Limited: *See*—
Kasamatsu, Kiyoshi; and Konishi, Hiroyuki, 4,518,594, Cl. 514-155.000.
Sumitomo Electric Industries, Ltd.: *See*—
Shiga, Tetsuya; Okawa, Shinichi; Yoshida, Kenichi; and Hiramoto, Junichi, 4,517,982, Cl. 128-635.000.
Sunago, Katsuyoshi; and Takenaka, Shinya, 4,517,973, Cl. 128-303.100.
Sun Electric Corporation: *See*—
Swis, Philip E.; and DiFonzo, Anthony E., 4,518,268, Cl. 374-144.000.
Sunago, Katsuyoshi; and Takenaka, Shinya, to Sumitomo Electric Industries, Ltd. Laser scalpel. 4,517,973, Cl. 128-303.100.
Sundstrand Corporation: *See*—
Glennon, Timothy F., 4,519,022, Cl. 363-41.000.
Sundstrand Data Control, Inc.: *See*—
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., 4,517,841, Cl. 73-517.0AV.
Sung, Rodney L.; Kaufman, Benjamin J.; and Dorn, Peter, to Texaco Inc. Fuel compositions containing N-alkyl glycyl imidazoline. 4,518,782, Cl. 548-353.000.
Sunstar Kabushiki Kaisha: *See*—
Makishima, Takao; Inaba, Shigeru; and Wada, Yasuyoshi, 4,518,099, Cl. 221-30.000.
Superior Electric Company, The: *See*—
Giguere, Irving J., 4,518,907, Cl. 318-696.000.
Surana, Bhupendra S.; and Snedden, William H., to Westinghouse Electric Corp. Digital coil diameter function generator and reel motor drive system embodying the same. 4,519,039, Cl. 364-469.000.

Suresh, Bindinganavle R.: *See*—
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.

Survival Technology, Inc.: *See*—
Tarello, William R.; Lopez, Claudio; Gordon, Linda A.; Whalen, Thomas D.; and Harvey, William B., 4,518,384, Cl. 604-61.000.

Sutphin, Eldon M., Jr., to RCA Corporation. Commutating filter passing only the fundamental frequency and odd harmonics thereof. 4,518,936, Cl. 333-173.000.

Suttles, James M., to Mead Corporation, The. Base element connection for sheet metal furniture. 4,518,279, Cl. 403-231.000.

Suur-Askola, Seppo: *See*—
Makinen, Heimo; and Suur-Askola, Seppo, 4,518,062, Cl. 187-29.00R.

Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,518,134, Cl. 242-199.000.

Suzuki, Shinji: *See*—
Kawabata, Yasuhiro; Kadokawa, Yoshio; Mori, Nobuyuki; and Suzuki, Shinji, 4,517,854, Cl. 74-492.000.

Suzuki, Tadashi: *See*—
Sonetaka, Kazunori; Nishino, Atsushi; and Suzuki, Tadashi, 4,518,347, Cl. 431-325.000.

Suzuki, Takashi: *See*—
Tanaka, Hiroshi; Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,518,952, Cl. 340-514.000.

Suzuki, Tetsuo: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Arai, Yoshio; Suzuki, Tetsuo; and Igarashi, Hitoshi, 4,517,727, Cl. 29-570.000.

Suzuki, Yasuo; Hirao, Hiroshi; and Nagasawa, Masanori, to Fujitsu Limited. Buffer circuit for driving a C-MOS inverter. 4,518,873, Cl. 307-451.000.

Suzuki, Yoshiji: *See*—
Takagi, Toshihiko; Kobayashi, Yoshikazu; Suzuki, Yoshiji; and Hara, Tsutomu, 4,519,064, Cl. 369-275.000.

Suzuki, Yoshio: *See*—
Aoshima, Atsushi; Suzuki, Yoshio; and Nakamura, Mikihiko, 4,518,462, Cl. 203-39.000.
Aoshima, Atsushi; Suzuki, Yoshio; Yamamatsu, Setsuo; and Yamaguchi, Tatsuo, 4,518,796, Cl. 560-208.000.

Svendsen, John A., to Minnesota Mining and Manufacturing Company. Device for processing thermally developable films and papers. 4,518,845, Cl. 219-216.000.

Svendsen, Leo: *See*—
Sorensen, Gunnar; and Svendsen, Leo, 4,518,738, Cl. 524-435.000.

Svensson, Lars-Erik: *See*—
Tengzelius, Jan R.; Blande, Carl-Axel; and Svensson, Lars-Erik, 4,518,427, Cl. 75-251.000.

Swallert, Sven A. Coffin. 4,517,713, Cl. 27-4.000.

Swanson, Eric J., to AT&T Bell Laboratories. Gate-coupled field-effect transistor pair amplifier. 4,518,926, Cl. 330-253.000.

Swanson, Steven E., to GTE Products Corporation. Fiber optic drawer connector assembly. 4,518,220, Cl. 350-96.200.

Swerdloff, Michael D.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation. Poly-phosphorodiamide urease inhibitors and urease inhibited urea based fertilizer compositions. 4,518,413, Cl. 71-28.000.

Swick, E. Grant: *See*—
Pleickhardt, George C.; and Swick, E. Grant, 4,518,293, Cl. 411-107.000.

Swieboda, Michael A.: *See*—
Johnston, George C.; and Swieboda, Michael A., 4,518,642, Cl. 428-172.000.

Swis, Philip E.; and DiFonzo, Anthony E., to Sun Electric Corporation. Diesel engine diagnostic system. 4,518,268, Cl. 374-144.000.

Syntex (U.S.A.) Inc.: *See*—
Khanna, Pyare L.; and Colvin, Floyd W., 4,518,701, Cl. 436-500.000.
Walker, Keith A. M., 4,518,607, Cl. 514-399.000.

Szarka, Geza: *See*—
Langner, Carl; Poran, Michael; and Szarka, Geza, 4,518,074, Cl. 198-425.000.

Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of an inclusion complex of N-(1--phenylethyl)-3,3-diphenylpropylamine and the hydrochloride thereof respectively with cyclodextrin. 4,518,588, Cl. 514-58.000.

'T Hoen, Pieter J., to North American Philips Corporation. Piezoelectric apodized ultrasound transducers. 4,518,889, Cl. 310-357.000.

Tachi, Ryosuke: *See*—
Matsui, Takeski; Ohyama, Hideo; Tachi, Ryosuke; Ito, Teruyoshi; and Kawai, Motoshi, 4,519,038, Cl. 364-431.030.

Tachikawa Pin Seisakujo Co., Ltd.: *See*—
Shiroyama, Tadayoshi, 4,518,109, Cl. 227-109.000.

Tachovsky, Otto H.: *See*—
Ross, Steven L.; and Tachovsky, Otto H., 4,517,751, Cl. 34-10.000.

Taggart, Kenneth J.; and Traub, Kevin W., to K-D Tools, Inc. Automatic torque wrench tester. 4,517,821, Cl. 73-1.00C.

Tagnon, Luc, to Essilor International Cie Generale d'Optique. Ophthalmic surgical laser apparatus. 4,517,980, Cl. 128-395.000.

Tagoshi, Hirotaka: *See*—
Yoshida, Haruo; Tagoshi, Hirotaka; Morohashi, Yasushi; and Tanikoshi, Toshiaki, 4,518,756, Cl. 526-313.000.

Taguchi, Sadanori; Aida, Toshiyuki; Yamamoto, Shigehiko; and Honda, Yukio, to Hitachi, Ltd. Impregnated cathode. 4,518,890, Cl. 313-346.00R.

Taguchi, Shunichi; Ohkawa, Shuji; Watanabe, Mitsuru; and Kikuchi, Itsuo, to Hitachi Heating Appliances Co., Ltd. High frequency heating apparatus with wireless temperature probe. 4,518,839, Cl. 219-10.55B.

Taiho Pharmaceutical Company Limited: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, 4,518,712, Cl. 514-255.000.

Tajima, Akira. Method of widening the angular field of a photographic objective lens. 4,518,227, Cl. 350-422.000.

Takacs, Istvan; Kerey, Gyorgy; Illes, Janos; Rudolf, Peter; Gere, Pal; Czebe, Laszlo; and Neszmelyi, Erzsebet, to Richter Gedeon Vegyeszeti Gyar RT. Process for the production of heparin-containing particulate products. 4,518,771, Cl. 536-21.000.

Takada, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Wheel for a vehicle. 4,518,204, Cl. 301-63.00R.

Takagi, Toshihiko; Kobayashi, Yoshikazu; Suzuki, Yoshiji; and Hara, Tsutomu, to Nippon Columbia Kabushikikaisha. Optical record disc. 4,519,064, Cl. 369-275.000.

Takahashi, Akira, to Ricoh Company, Ltd. Distance measurement system. 4,518,253, Cl. 356-4.000.

Takahashi, Hideaki; Shoji, Tetsuo; Saitoh, Kiyoshi; Muramatsu, Masamitsu; and Kimura, Kazushige, to Kabushiki Kaisha Toshiba; Hideaki Takahashi; and Tetsuo Shoji. Method of detecting embrittlement of heat-resisting steel. 4,518,464, Cl. 204-1.00T.

Takahashi, Masahiro; Hagiwara, Toshio; Kakei, Tsutomu; and Oda, Kazutaka, to Fuji Photo Film Co., Ltd.; and Nippon Light Metal Company Ltd. Web conveying method. 4,518,466, Cl. 204-28.000.

Takahashi, Nobuo: *See*—
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,518,674, Cl. 430-108.000.

Takahashi, Sadahiro: *See*—
Yagi, Eiji; Kobari, Yuji; and Takahashi, Sadahiro, 4,518,055, Cl. 180-142.000.

Takahashi, Toshiro: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshiro; Hirano, Shigeo; Hirose, Takeshi; and Adachi, Keiichi, 4,518,682, Cl. 430-543.000.

Takaku, Kazuo; Naruse, Akisuke; Fujimoto, Hirotsugu; and Kimura, Hiroshi, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Rail apparatus around nuclear reactor pressure vessel and method of installing the same. 4,518,560, Cl. 376-245.000.

Takakuwa, Sadao: *See*—
Tanaka, Motomu; Osuka, Masanari; Kuri, Takeshi; and Takakuwa, Sadao, 4,518,764, Cl. 528-271.000.

Takano, Sakuharu: *See*—
Nishibori, Toshiki; Kita, Sumio; and Takano, Sakuharu, 4,518,159, Cl. 271-103.000.

Takano, Yoshiya; and Hoshi, Yoshikazu. Fuel injection pump. 4,517,946, Cl. 123-450.000.

Takase, Toshio: *See*—
Watanabe, Masaru; Sakai, Toshihide; and Takase, Toshio, 4,517,882, Cl. 98-6.000.

Takasu, Yasuhito: *See*—
Inoue, Shingo; Iwata, Toshiharu; and Takasu, Yasuhito, 4,517,944, Cl. 123-425.000.

Takasugi, Hisashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Takata, Harry H., to Ag-Chem Equipment Co., Inc. Modular low pressure strip spraying apparatus and system. 4,518,118, Cl. 239-163.000.

Takaya, Takao: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,518,774, Cl. 544-22.000.

Takayasu, Hidekazu, to Yamaha Hatsudoki Kabushika Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Multi-fuel carburetor. 4,518,540, Cl. 261-18.00B.

Takeda Chemical Industries, Ltd.: *See*—
Imada, Akira; Harada, Setsuo; and Asai, Mitsuko, 4,518,529, Cl. 260-245.20T.
Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto, 4,518,698, Cl. 435-317.000.
Terao, Shinji; and Nishikawa, Kohei, 4,518,602, Cl. 514-332.000.

Takeda, Hideo; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Coating solution metering method and apparatus. 4,518,637, Cl. 427-359.000.

Takenaka, Shinya: *See*—
Sunago, Katsuyoshi; and Takenaka, Shinya, 4,517,973, Cl. 128-303.100.

Takenouchi, Tsutomu; Nagasawa, Tsunehiko; and Nanasawa, Masatada, to Toshiba-EMI Limited. Method of recording and reproducing visual information in audio recording medium and audio recording medium recorded with visual information. 4,519,008, Cl. 360-79.000.

Takeshita, Kaneyoshi, to Sony Corporation. Solid state image sensor. 4,518,978, Cl. 357-24.000.

Takeuchi, Hironori: *See*—
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, 4,518,962, Cl. 340-870.280.

Takeuchi, Kano : *See*—
Miyake, Toshio; Yoshida, Mikihiko; and Takeuchi, Kano 4,518,581, Cl. 424-48.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.

Tamatani, Masaaki; Tsuda, Nobuyuki; Koike, Norio; and Ajiro, Sakae, to Tokyo Shibaura Denki Kabushiki Kaisha. Projection type green cathode ray tube, method for manufacturing phosphor screen for the same, and projection video device using the same. 4,518,985, Cl. 358-60.000.

Tamura, Morio: *See*—
Hashimoto, Hisayoshi; and Tamura, Morio, 4,517,878, Cl. 91-396.000.

Tamura, Takahiro: *See*—
Mizuno, Takao; Uchikawa, Naoshi; Murayama, Akira; and Tamura, Takahiro, 4,518,324, Cl. 417-366.000.

Tanaka, Atsuo: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,517,719, Cl. 29-124.000.

Tanaka, Haruto: *See*—
Kuroki, Junsuke; Irie, Namio; and Tanaka, Haruto, 4,518,169, Cl. 280-6.00R.

Tanaka, Hiroshi; and Yamamoto, Yoshihiro. Manufacturing process for sintered ceramic body for cutting tools. 4,518,398, Cl. 51-309.000.

Tanaka, Hiroshi; Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, to Nittan Company, Limited. Sensor test circuit of an alarm system. 4,518,952, Cl. 340-514.000.

Tanaka, Hirotoshi: *See*—
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Tanaka, Hirotoshi, 4,518,868, Cl. 307-306.000.

Tanaka, Kazuo; Motonaga, Kenjiro; and Tanaka, Kozo, to Kobe Steel, Limited. Method for controlling the pulverization and dryness of flammable materials passing through a pulverizer, and method of controlling the pulverizing rate of the pulverizer. 4,518,123, Cl. 241-18.000.

Tanaka, Kozo: *See*—
Tanaka, Kazuo; Motonaga, Kenjiro; and Tanaka, Kozo, 4,518,123, Cl. 241-18.000.

Tanaka, Mamoru: *See*—
Kawakami, Kouichi; and Tanaka, Mamoru, 4,517,852, Cl. 74-89.150.

Tanaka, Masayuki: *See*—
Mashimo, Satoshi; Tanaka, Masayuki; and Yamaguchi, Yoshio, 4,518,375, Cl. 474-205.000.

Tanaka, Motomu; Osuka, Masanari; Kuri, Takeshi; and Takakuwa, Sadao, to Osaka Soda Co. Ltd. Diallyl terephthalate copolymer and composition comprising said copolymer. 4,518,764, Cl. 528-271.000.

Tanaka, Seiichi: *See*—
Tanaka, Hiroshi; Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,518,952, Cl. 340-514.000.

Tanaka, Seiichiro: *See*—
Okada, Hisao; Tanaka, Seiichiro; and Kawaberi, Seiji, 4,518,993, Cl. 358-114.000.

Tanaka, Toshie, to Nifco Inc. Plate clamping device. 4,517,711, Cl. 24-453.000.

Tanaka, Yukio: *See*—
Banno, Takashi; Seki, Tadashi; Kawaguchi, Masafumi; Tanaka, Yukio; Iwasaki, Morikatsu; and Nagasawa, Toshio, 4,518,353, Cl. 432-205.000.

Tani, Shigetaka; and Nagahara, Toshio, to Toyama Machine Works, Limited. Balancing device. 4,517,853, Cl. 74-89.150.

Tanikoshi, Toshiaki: *See*—
Yoshida, Haruo; Tagoshi, Hirotaka; Morohashi, Yasushi; and Tanikoshi, Toshiaki, 4,518,756, Cl. 526-313.000.

Tanner, Dale. Metering device for fluids. 4,518,102, Cl. 222-61.000.

Tanner, Herbert: *See*—
Bolze, Rudolf; Geiger, Friedhelm; Spindler, Manfred; and Tanner, Herbert, 4,518,801, Cl. 562-559.000.

Tanner, Howard M. C., to HGM, Inc. Disposable hand piece for surgical lasers. 4,517,974, Cl. 128-303.100.

Tantillo, Donnie J.; Kratochvil, David F.; Moore, Robert G.; and Browne, Edward M., to Geosource Inc. Electronic roll-a-long switch. 4,519,052, Cl. 367-79.000.

Tapscott, Donald A., to General Foods Incorporated. Apparatus and method for testing for leakages in hermetically-sealed packages. 4,517,827, Cl. 73-45.400.

Tarello, William R.; Lopez, Claudio; Gordon, Linda A.; Whalen, Thomas D.; and Harvey, William B., to Survival Technology, Inc. Multiple medicament cartridge clip and medicament discharging device therefor. 4,518,384, Cl. 604-61.000.

Tarnowski, Andrew A.; and Anderson, Brian G., to Image Graphics, Incorporated. Method and apparatus for correcting image distortions. 4,518,898, Cl. 315-371.000.

Tartaglia, John A. Medicine container having lyophilized powder and diluent stored in separate sealed chambers. 4,518,386, Cl. 604-89.000.

Tarumi, Noriyoshi; Okamoto, Yukio; Kimura, Kiyoshi; Fukuchi, Masakazu; Miwa, Tadashi; and Ito, Kunio, to Konishiroku Photo Industry Co., Ltd. Recording apparatus. 4,518,976, Cl. 346-153.100.

Taylor, Chandler R., Jr.: *See*—
Lo, Young S.; and Taylor, Chandler R., Jr., 4,518,603, Cl. 514-352.000.

Taylor, Charles F.; Wnukiewicz, Stanley A., Jr.; and Gattiker, Anton, to Phase One Products Corporation. Photographic print making and developing tray assembly. 4,518,240, Cl. 354-312.000.

Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Ink jet printer vacuum purging system. 4,518,973, Cl. 346-140.00R.

Tech Development Inc.: *See*—
Coons, Terry L., 4,518,310, Cl. 415-36.000.

Tecnoma: *See*—
Ballu, Patrick J., 4,518,122, Cl. 239-530.000.

Tecumseh Products Company: *See*—
Pirkey, Robert J.; and Ditter, Stephen D., 4,517,942, Cl. 123-376.000.

Teich, Michael: *See*—
Schafer, Helmut; Huckler, Volker; and Teich, Michael, 4,517,856, Cl. 74-528.000.

Teijin Limited: *See*—
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, 4,518,962, Cl. 340-870.280.

Telecalc, Inc.: *See*—
Brinkerhoff, Jesse R.; and Brinkerhoff, Richard S., 4,518,825, Cl. 179-11.000.

Teleflex Incorporated: *See*—
Mircha, Basil, 4,517,765, Cl. 49-3.000.

Templin, Philip R.; and Fareri, Elizabeth L., to Gulf Research & Development Company. Wax-impregnated fire kindling sticks. 4,518,394, Cl. 44-38.000.

Tengzelius, Jan R.; Blande, Carl-Axel; and Svensson, Lars-Erik, to Hoganas AB. Iron or steel powder, a process for its manufacture and press-sintered products made therefrom. 4,518,427, Cl. 75-251.000.

Tennant, William A.: *See*—
Latreille, Maurice G.; and Tennant, William A., 4,518,344, Cl. 425-570.000.

Teramachi, Hiroshi. Linear slide roller bearing unit. 4,518,206, Cl. 308-6.00C.

Terao, Shinji; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. Vinyl carboxylic acid derivatives, their production and use as inhibitors of thromboxane synthetase. 4,518,602, Cl. 514-332.000.

Terradex Corporation: *See*—
Alter, H. Ward; and Oswald, Richard A., 4,518,860, Cl. 250-253.000.

Teshima, Kenzo: *See*—
Hatakeyama, Yoshiharu; Ishikawa, Tatsuo; and Teshima, Kenzo, 4,518,554, Cl. 264-262.000.

Teslawski, Georg; and Corl, Paul D., to Diasonics, Inc. Neonate ultrasonic scanner. 4,517,985, Cl. 128-660.000.

Teslenko, Leonard: *See*—
Hull, Richard W.; and Teslenko, Leonard, 4,519,086, Cl. 375-120.000.

Tetsuo Shoji: *See*—
Takahashi, Hideaki; Shoji, Tetsuo; Saitoh, Kiyoshi; Muramatsu, Masamitsu; and Kimura, Kazushige, 4,518,464, Cl. 204-1.00T.

Texaco Inc.: *See*—
Cuscurida, Michael; Waddill, Harold G.; and Peterson, Bruce W., 4,518,720, Cl. 521-156.000.
Cuscurida, Michael, 4,518,778, Cl. 544-398.000.
Knifton, John F., 4,518,715, Cl. 518-700.000.
Maddox, Jim, Jr.; and Schievelbein, Vernon H., 4,518,038, Cl. 166-266.000.
Sung, Rodney L.; Kaufman, Benjamin J.; and Dorn, Peter, 4,518,782, Cl. 548-353.000.
Waddill, Harold G.; and Schulze, Heinz, 4,518,749, Cl. 525-504.000.

Texas Instruments Incorporated: *See*—
Bedenbender, John W.; and Kelly, Gilbert H., deceased, 4,519,053, Cl. 367-190.000.
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., 4,519,045, Cl. 364-709.000.
Hanson, Kerry A., 4,519,083, Cl. 375-9.000.
Magar, Surendar; and Gass, Wanda K., 4,519,031, Cl. 364-200.000.
Thompson, E. Earle, 4,519,029, Cl. 364-200.000.

Textilma AG: *See*—
Speich, Francisco, 4,518,020, Cl. 139-55.100.

Textron Inc.: *See*—
Matuschek, Josip, 4,518,295, Cl. 411-291.000.

Thomas & Betts Corporation: *See*—
Brandeau, Edward P., 4,518,216, Cl. 339-97.00P.

Thomas, Gareth J.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,518,784, Cl. 549-39.000.

Thomasson, William R., to Coles Cranes Limited. Booms for cranes and the like. 4,518,090, Cl. 212-189.000.

Thompson, Charles R.: *See*—
Reitmeier, Glenn A.; and Thompson, Charles R., 4,518,996, Cl. 358-148.000.

Thompson, Craig R.; Carnes, Ronald C.; and Naumann, Ted F., Jr., to General Electric Company. Ultrasonic sector scanner having fluid replacement capability. 4,517,840, Cl. 73-644.000.

Thompson, Dorman N., Jr.: *See*—
Pearson, Walter C.; and Thompson, Dorman N., Jr., 4,518,296, Cl. 412-37.000.

Thompson, E. Earle, to Texas Instruments Incorporated. Data communications system with automatic communications mode. 4,519,029, Cl. 364-200.000.

Thompson, Elmer E. Wiener roaster. 4,517,885, Cl. 99-421.0HV.

Thompson, Fred E.: *See*—
Chisholm, William M.; and Thompson, Fred E., 4,518,085, Cl. 206-454.000.

Thompson, Marion E. Light bulb attached sign assembly. 4,517,758, Cl. 40-431.000.
Thoms, Roland, to Buckbee Mears Company. Television picture tube with aperture mask having recesses therein. 4,518,892, Cl. 313-403.000.
Thomsen, Arne: *See—*
Ransheim, Anders P.; Thomsen, Arne; and Holmgren, Per, 4,517,845, Cl. 73-861.050.
Thomson-CSF: *See—*
Catros, Jean Y., 4,519,085, Cl. 375-27.000.
Hetyei, Joseph, 4,518,964, Cl. 343-7.300.
Lamboley, Jean J., 4,518,867, Cl. 307-252.00B.
Le Ny, Jacques; and Val, Christian, 4,518,818, Cl. 174-52.0FP.
Ravinet, Pierre; and Micheron, Francois, 4,518,555, Cl. 264-292.000.
Thyssen Industrie Aktiengesellschaft: *See—*
Bornemann, Hans-Joachim; and Zlab, Horst, 4,518,262, Cl. 366-156.000.
TI (Group Services) Limited: *See—*
Graham, William R., 4,517,721, Cl. 29-157.30C.
Tibbetts, George C.: *See—*
Stanley, W. Kent; and Tibbetts, George C., 4,518,831, Cl. 179-119.00A.
Tibbetts Industries, Inc.: *See—*
Stanley, W. Kent; and Tibbetts, George C., 4,518,831, Cl. 179-119.00A.
Tice, Gregory, to Becton Dickinson and Company. System for controlling septum damage. 4,517,851, Cl. 73-864.910.
Timm, Gerald W.; Sandford, Donald L.; and Claude, Timothy J., to Dacomed Corporation. Penile prosthesis. 4,517,967, Cl. 128-79.000.
Tindall, Gary W.; Lysenko, George P.; Vize, Richard J.; Kiefer, Edward H.; and Smith, Richard J., to Deere & Company. Window structure for tractor cab. 4,518,195, Cl. 296-148.000.
Tinti, Maria O.: *See—*
Cavazza, Claudio; and Tinti, Maria O., 4,518,613, Cl. 514-513.000.
Tobias, John D. Pipe rack. 4,517,993, Cl. 131-329.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fujimoto, Shigeru, 4,517,769, Cl. 51-105.00R.
Fukuoka, Yoshitaka; and Komine, Toshiaki, 4,517,738, Cl. 29-840.000.
Hidaka, Kazutaka, 4,518,965, Cl. 343-742.000.
Ishida, Tsuyoshi, 4,518,919, Cl. 324-228.000.
Kimoto, Katsumi; and Ishihara, Atsushi, 4,519,056, Cl. 369-43.000.
Kurihara, Teruo; and Oowa, Takeshi, 4,519,093, Cl. 378-132.000.
Masuda, Eiji; and Matsuo, Kenji, 4,518,880, Cl. 307-577.000.
Munetsugu, Eiichi, 4,519,044, Cl. 364-709.000.
Nakamura, Kunihiko, 4,518,161, Cl. 271-303.000.
Nawata, Yoshiaki, 4,518,900, Cl. 318-102.000.
Tamatani, Masaaki; Tsuda, Nobuyuki; Koike, Norio; and Ajiro, Sakae, 4,518,985, Cl. 358-60.000.
Toyoda, Nobuyuki; and Hojo, Akimichi, 4,518,871, Cl. 307-443.000.
Umezu, Kenji, 4,517,812, Cl. 62-228.500.
Tomforde, Johann: *See—*
Gallitzendorfer, Joseph; Pfeiffer, Peter; Tomforde, Johann; Parisch, Jochen; and Zweigart, Gerhard, 4,518,197, Cl. 296-213.000.
Tomono, Makoto: *See—*
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,518,674, Cl. 430-108.000.
Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Intermediate adapter for camera. 4,518,239, Cl. 354-286.000.
Tonn, Jeffrey F.: *See—*
Peters, Rex B.; Tonn, Jeffrey F.; Malametz, Arnold; Hilliker, Richard A.; and Corey, Victor B., 4,517,841, Cl. 73-517.0AV.
Toole, James: *See—*
Stansfield, James F.; Toole, James; and Topham, Arthur, 4,518,435, Cl. 106-308.00N.
Topfl, Werner: *See—*
Meyer, Willy; Fory, Werner; and Topfl, Werner, 4,518,776, Cl. 544-206.000.
Topham, Arthur: *See—*
Stansfield, James F.; Toole, James; and Topham, Arthur, 4,518,435, Cl. 106-308.00N.
Toplak, Ernst: *See—*
Gillhaus, Horst; Hegewaldt, Fritz; Faber, Wolfgang; Baer, Jurgen; and Toplak, Ernst, 4,518,352, Cl. 432-199.000.
Toray Industries, Inc.: *See—*
Kataoka, Mutsuo, 4,518,675, Cl. 430-256.000.
Yoshida, Shusuke; Nakajima, Tamotsu; and Okamoto, Miyoshi, 4,517,715, Cl. 28-144.000.
Toray Silicone Company, Ltd.: *See—*
Kageyama, Katsuaki; and Adachi, Ysushi, 4,518,244, Cl. 355-3.0FU.
Toshiba-EMI Limited: *See—*
Takenouchi, Tsutomu; Nagasawa, Tsunehiko; and Nanasawa, Masatada, 4,519,008, Cl. 360-79.000.
Towmotor Corporation: *See—*
Melocik, Grant C.; and Pickering, William, 4,518,902, Cl. 318-373.000.
Toyama Machine Works, Limited: *See—*
Tani, Shigetaka; and Nagahara, Toshio, 4,517,853, Cl. 74-89.150.
Toyama, Masamichi, to Canon Kabushiki Kaisha. Automatic focus adjusting device. 4,518,242, Cl. 354-403.000.
Toyoda, Nobuyuki; and Hojo, Akimichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ga/As NOR/NAND gate circuit using enhancement mode FET's. 4,518,871, Cl. 307-443.000.
Toyooka, Takashi; Aoki, Hirokazu; and Sugie, Mamoru, to Hitachi, Ltd. Magnetic bubble memory having auxiliary storage loops. 4,519,049, Cl. 365-12.000.
Toyosu, Yasuhiro; and Akamatsu, Norio. Electrode sets with resiliently mounted pin electrodes. 4,517,983, Cl. 128-639.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Ito, Toshimitsu; and Isobe, Toshiaki, 4,517,949, Cl. 123-489.000.
Nakagawa, Norihisa, 4,517,941, Cl. 123-336.000.
Suganuma, Tetsuya; and Kazuoka, Koji, 4,518,563, Cl. 419-29.000.
Yamada, Makoto; Kubota, Tatsushi; and Kojima, Ikuzo, 4,518,173, Cl. 280-806.000.
Transtech Industrial Corporation: *See—*
Jow, Long S.; and Jow, Long J., 4,518,067, Cl. 192-0.090.
Traub, Kevin W.: *See—*
Taggart, Kenneth J.; and Traub, Kevin W., 4,517,821, Cl. 73-1.00C.
Traut, G. Robert, to Rogers Corporation. Dielectric material and method of making the dielectric material. 4,518,737, Cl. 524-413.000.
Traver, Frank J., to General Electric Company. Water based resin emulsions. 4,518,727, Cl. 524-35.000.
Treadgold, Richard C., to Dow Corning Limited. Silylation process. 4,518,787, Cl. 556-442.000.
Tressler, Richard E.; Stach, Joseph; and Baeten, Roger L., to Better Semiconductor Processes (BSP). Cantilevered boat-free semiconductor wafer handling system. 4,518,349, Cl. 432-11.000.
Trevisan, Carey S.: *See—*
Yarossi, Mary E.; and Trevisan, Carey S., 4,518,553, Cl. 264-234.000.
Tribbett, Murray C., to French Oil Mill Machinery Co., The. Hydraulic press. 4,518,337, Cl. 425-167.000.
Trieu, Tom: *See—*
Khan, Mahboob; and Trieu, Tom, 4,517,731, Cl. 29-571.000.
Trilack Utrustningar AB: *See—*
Andersson, Arne; and Larsson, Peter, 4,518,265, Cl. 366-318.000.
Troglia, Claudio: *See—*
Zamboni, Valentino; Brichta, Corrado; and Troglia, Claudio, 4,518,731, Cl. 524-166.000.
Trott, Millard C. Playing court and method of use. 4,518,166, Cl. 273-411.000.
Trotter, Donald M.: *See—*
Borrelli, Nicholas F.; and Trotter, Donald M., 4,518,222, Cl. 350-167.000.
TRW Inc.: *See—*
Faris, Alan E., 4,518,944, Cl. 338-22.00R.
Kraus, Willibald, 4,518,297, Cl. 411-437.000.
Tsai, Tsu-tzu: *See—*
Rosenberg, Harold; and Tsai, Tsu-tzu, 4,518,759, Cl. 528-35.000.
Tschan, Rene , to Lonza, Ltd. Device for inserting a resiliently deformable article into a pocket. 4,517,723, Cl. 29-235.000.
Tsuboi, Yoshiaki: *See—*
Ueda, Fumio; Tsuboi, Yoshiaki; Arai, Hirotsugu; Horikiri, Kenji; and Ideno, Hiroaki, 4,518,959, Cl. 340-784.000.
Tsuda, Nobuaki; Kominami, Naoya; Inagaki, Kenji; and Imamiya, Tamotsu, to Asahi Kasei Kogyo Kabushiki Kaisha. Blood treating system. 4,518,497, Cl. 210-259.000.
Tsuda, Nobuyuki: *See—*
Tamatani, Masaaki; Tsuda, Nobuyuki; Koike, Norio; and Ajiro, Sakae, 4,518,985, Cl. 358-60.000.
Tsukagoshi, Tsunehiro: *See—*
Yokozeki, Shinichi; Kimura, Masami; and Tsukagoshi, Tsunehiro, 4,518,443, Cl. 148-400.000.
Tsurushima, Katsuaki; Furuya, Tsuneo; and Fukami, Tadashi, to Sony Corporation. Optical disc player. 4,519,058, Cl. 369-53.000.
Tuason, Domingo C., Jr.: *See—*
McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 4,518,433, Cl. 106-180.000.
Tubular Fabricators Ind., Inc.: *See—*
Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., 4,518,002, Cl. 135-67.000.
Turbard, Alan M.: *See—*
Foley, Peter N.; and Turbard, Alan M., 4,517,810, Cl. 62-186.000.
Turco, Loreto: *See—*
Cilindro, Leticia D., 4,518,288, Cl. 409-219.000.
Turcsan, Istvan: *See—*
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.
Twersky, David Z.: *See—*
Eigen, Edward; Twersky, David Z.; and Brachman, Dina I., 4,518,517, Cl. 252-107.000.
Twomey, James R.; McCutcheon, Hugh W.; and Harris, Richard K., to Slope Indicator Co. Fluid pressure transducer. 4,517,842, Cl. 73-701.000.
Tyler, Derek E.: *See—*
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,518,030, Cl. 164-503.000.
UBE Industries, Ltd.: *See—*
Uchiumi, Shinichiro; and Ataka, Kikuo, 4,518,793, Cl. 560-175.000.
Uchikawa, Naoshi: *See—*
Mizuno, Takao; Uchikawa, Naoshi; Murayama, Akira; and Tamura, Takahiro, 4,518,324, Cl. 417-366.000.
Uchiumi, Shinichiro; and Ataka, Kikuo, to UBE Industries, Ltd. Preparation of acetone dicarboxylic acid diesters. 4,518,793, Cl. 560-175.000.

Ueda, Fumio; Tsuboi, Yoshiaki; Arai, Hirotsugu; Horikiri, Kenji; and Ideno, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Electronic analog display device. 4,518,959, Cl. 340-784.000.

Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, to Fujisawa Pharmaceutical Co., Ltd. 3-Cephem intermediates. 4,518,774, Cl. 544-22.000.

Ueda, Makoto, to Seiko Instruments & Electronics Ltd. Driving device of stepping motor. 4,518,906, Cl. 318-696.000.

Ueda, Sanae: *See—*
Hori, Takashi; Ueda, Sanae; and Kojima, Yoshihiro, 4,518,807, Cl. 568-716.000.

Uehara, Kazuo: *See—*
Karakama, Tadao; and Uehara, Kazuo, 4,517,800, Cl. 60-337.000.

Ueno, Sadayasu: *See—*
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.

Uerdingen, Walter: *See—*
Lindner, Christian; Ott, Karl-Heinz; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,743, Cl. 525-80.000.
Ott, Karl-Heinz; Lindner, Christian; Uerdingen, Walter; Braese, Hans-Eberhard; and Hurnik, Helmut, 4,518,515, Cl. 525-79.000.

Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Chemically modified asphalts and glass fibers treated therewith. 4,518,741, Cl. 525-54.500.

Ulrich, Franz W.: *See—*
Fant, Karl M.; Fundakowski, Richard A.; Levitt, Tod S.; Overland, John E.; Suresh, Bindinganavle R.; and Ulrich, Franz W., 4,519,041, Cl. 364-552.000.

Umekawa, Osamu; and Katayama, Sakae, to Katayama Chemical Works Co., Ltd.; and Yoshitomi Pharmaceutical Industries, Ltd. Microbicidal/microbistatic compositions and use thereof employing mixtures of 4,5-dichloro-1,2-dithiol-3-one and alkylenebisthiocyanate. 4,518,610, Cl. 514-516.000.

Umemoto, Makoto: *See—*
Hirano, Tsumoru; Umemoto, Makoto; and Hirano, Mitsunori, 4,518,687, Cl. 430-548.000.

Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. N-[4-(3-aminopropyl)-aminobutyl]-2-(ω-guanidino-fatty-acid-amido)-2-substituted-ethanamide and salt thereof. 4,518,532, Cl. 260-404.500.

Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. N-[4-[(3-aminopropyl-)amino]butyl]-2,2-dihydroxyethanamide. 4,518,802, Cl. 564-201.000.

Umezu, Hiroaki: *See—*
Hanaoka, Tadashi; and Umezu, Hiroaki, 4,517,799, Cl. 62-323.100.

Umezu, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Load control device for a heat-pump type air conditioning apparatus. 4,517,812, Cl. 62-228.500.

Underhill, Kenneth R.: *See—*
Walker, James D.; Underhill, Kenneth R.; and Campbell, Willis R., 4,517,889, Cl. 100-5.000.

Unger, Harold: *See—*
Michel, Thomas J., 4,517,963, Cl. 128-6.000.

Union Carbide Corporation: *See—*
Abatjoglou, Anthony G.; and Bryant, David R., 4,518,805, Cl. 568-444.000.
Chiu, Herman S., 4,518,619, Cl. 426-265.000.

Union Oil Company of California: *See—*
Young, Dean A., 4,518,703, Cl. 502-63.000.

Uniroyal, Inc.: *See—*
Batorewicz, Wadim; and Wheeler, Edward L., 4,518,803, Cl. 564-410.000.

Unisearch Limited: *See—*
Alexander, Peter W.; and Haddad, Paul R., 4,518,463, Cl. 204-1.00T.
Frost, Richard B., 4,517,977, Cl. 128-305.000.

Unit Rig & Equipment Co.: *See—*
Van Dyke, Harry, 4,517,839, Cl. 73-432.00R.

United States Gypsum Company: *See—*
Willoughby, Michael D., 4,518,652, Cl. 428-312.400.

United States Manufacturing Company: *See—*
Greene, Ted J.; and Irons, George F., 4,517,968, Cl. 128-80.00H.

United States of America
Air Force: *See—*
Gilson, Alan P., 4,519,055, Cl. 369-37.000.
Rosenberg, Harold; and Tsai, Tsu-tzu, 4,518,759, Cl. 528-35.000.
Army: *See—*
Garcia, Moises R., deceased, 4,517,862, Cl. 81-119.000.
Gilvydis, Jaunutis B., 4,518,990, Cl. 358-87.000.
Hamer, Howard, 4,519,079, Cl. 371-38.000.
Roberts, Thomas G., 4,517,798, Cl. 60-39.462.
Energy: *See—*
Fish, Richard H., 4,518,490, Cl. 208-251.00R.
Frost, Charles B., 4,518,718, Cl. 521-122.000.
Gillett, James E.; Garner, Daniel C.; Wineman, Arthur L.; and Robey, Robert M., 4,517,927, Cl. 122-510.000.
Hearn, William E.; and Rondeau, Donald J., 4,518,877, Cl. 307-490.000.
Weller, Sol W., 4,518,478, Cl. 208-8.0LE.
Environmental Protection Agency: *See—*
Pontius, Duane H.; and Bush, Phillip V., 4,518,401, Cl. 55-101.000.
National Aeronautics and Space Administration: *See—*
Bush, Harold G.; and Wallsom, Richard E., 4,518,277, Cl. 403-102.000.
Schutt, John B.; and Shai, Michael C., 4,518,722, Cl. 523-135.000.
Westfall, Leonard J., 4,518,625, Cl. 427-37.000.
Navy: *See—*
Danforth, Philip G.; Bucko, Thomas G.; Galliher, Kenneth R.; Lucia, Joseph T.; Miller, Richard L.; and Straw, Timothy B., 4,518,915, Cl. 324-158.00R.
Jones, Thomas E., 4,518,632, Cl. 427-118.000.
Schneider, Irwin, 4,519,082, Cl. 372-42.000.

U.S. Philips Corporation: *See—*
Dielhof, Pieter B., 4,518,923, Cl. 330-9.000.
Dureux, Pierre J. C., 4,518,991, Cl. 358-93.000.
Geboers, Josephus J. A.; and Janssen, Daniel J. G., 4,518,828, Cl. 179-81.00R.
Guittard, Pierre; Jarry, Philippe; Ducarre, Alphonse; and Haji, Lazhar, 4,518,980, Cl. 357-30.000.
Koppe, Rudolf P.; and Blom, Hendrik, 4,518,927, Cl. 330-284.000.
Kroner, Klaus, 4,518,933, Cl. 331-108.00D.
Meignant, Didier S., 4,517,730, Cl. 29-571.000.
Moulding, Kenneth W., 4,518,878, Cl. 307-520.000.
van Roermund, Arthur H. M., 4,518,935, Cl. 333-173.000.
VanRoessel, Frederik J., 4,518,948, Cl. 340-347.0NT.

United Technologies Automotive, Inc.: *See—*
Wooldridge, George A., 4,518,836, Cl. 200-61.540.

United Technologies Corporation: *See—*
Chin, Herbert A., 4,518,442, Cl. 148-11.50N.
Wagner, Thomas R., 4,518,837, Cl. 200-81.00R.

University of Guelph: *See—*
Beversdorf, Wallace D.; Erickson, Lawrence R.; and Grant, Ian, 4,517,763, Cl. 47-58.000.

University of Waterloo: *See—*
Wynnyckyj, John R., 4,518,425, Cl. 75-67.00R.

University Patents, Inc.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,517,970, Cl. 128-131.000.

UOP Inc.: *See—*
Brennan, John F., 4,518,710, Cl. 502-309.000.

Uzet GmbH & Co.: *See—*
Reichmann, Albert; Sternisa, Danilo; Mermi, Kurt; and Kistner, Herbert, 4,518,290, Cl. 411-30.000.

Upjohn Company, The: *See—*
Grossman, Steven J.; and Onder, Kemal, 4,518,765, Cl. 528-314.000.
Fylton, Thomas A., 4,518,799, Cl. 562-423.000.
Jacobine, Anthony F., 4,518,473, Cl. 204-159.180.

Upsher, Michael S. Dual bladed laryngoscope. 4,517,964, Cl. 128-11.000.

Ura, Katsumi; Inui, Taiji; and Sakka, Kenji, to Hitachi, Ltd. Condenser vacuum retaining apparatus for steam power plant. 4,517,804, Cl. 60-657.000.

Urawa, Motoo; and Imai, Eiichi, to Canon Kabushiki Kaisha. Cyan color toner for developing electrostatic image. 4,518,672, Cl. 430-106.000.

Urban, Virginia L.: *See—*
Greene, Donald F.; and Urban, Virginia L., 4,518,585, Cl. 424-130.000.

Urmet Sud S.P.A.: *See—*
Mondardini, Massimo, 4,518,824, Cl. 179-6.3CC.

USM Corporation: *See—*
Oefinger, Richard W.; and Babyak, Richard J., 4,517,820, Cl. 72-391.000.

Vaillant, Michael; and Klarhorst, Gunter. Apparatus for generating an aerosol. 4,518,404, Cl. 55-256.000.

Val, Christian: *See—*
Le Ny, Jacques; and Val, Christian, 4,518,818, Cl. 174-52.0FP.

Valbert, Gary G.: *See—*
Mitchell, Thomas L.; McMahill, Patrick D.; Valbert, Gary G.; and Wellauer, John C., 4,518,276, Cl. 403-13.000.

Valbona, Bruno M.: *See—*
Brym, Stanley J.; and Valbona, Bruno M., 4,518,263, Cl. 366-206.000.

Valco Cincinnati, Inc.: *See—*
Santefort, Richard A., 4,517,917, Cl. 118-302.000.

Valdes, Guillermo A.; Pacheco, Benjamin G.; Figueredo, Fernando F.; and Framil, Armando. Oscillating cutting element. 4,518,022, Cl. 30-166.00R.

Vale, Wylie W., Jr.: *See—*
Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,518,586, Cl. 514-12.000.

Valley Sales Co.: *See—*
McCan, Duane A.; and Smith, Carl L., Jr., 4,517,924, Cl. 119-98.000.

Valtion Teknillinen Tutkimuskeskus: *See—*
Autio, Karin; Kiesvaara, Martti; and Malkki, Yrjo , 4,518,525, Cl. 260-112.00B.

Van Dorn Co.: *See—*
Milton, James W.; and Boig, Robert W., 4,518,097, Cl. 220-307.000.

Vanderlei, Clarence B. Round bale carrier and unroller. 4,518,299, Cl. 414-24.600.

van der Poel, Pieter W., to CSM Suiker B.V. Process for the production of graft crystals for use in seeding sugar boiling brines. 4,518,436, Cl. 127-60.000.

Van Dyke, Harry, to Unit Rig & Equipment Co. Off-highway vehicle systems simulator and control panel testing. 4,517,839, Cl. 73-432.00R.
van Roermund, Arthur H. M., to U.S. Philips Corporation. Band-rejection filter of the switched capacitor type. 4,518,935, Cl. 333-173.000.
VanRoessel, Frederik J., to U.S. Philips Corporation. Analog-to-digital converter. 4,518,948, Cl. 340-347.0NT.
Van Scott, Eugene J.: *See*—
Yu, Ruey J.; and Van Scott, Eugene J., 4,518,789, Cl. 560-105.000.
Varian Associates, Inc.: *See*—
Garrett, Charles B., 4,518,078, Cl. 198-775.000.
Wiseman, Alan G.; and Huberts, John T., 4,517,850, Cl. 73-864.210.
Varley, Robert F., to Robert F. Varley Co., Inc. Method for improved hydraulic jetting of drill bore holes using high pressure pulses of fluid. 4,518,048, Cl. 175-61.000.
Vatsushita Electric Industrial Company, Limited: *See*—
Sonetaka, Kazunori; Nishino, Atsushi; and Suzuki, Tadashi, 4,518,347, Cl. 431-325.000.
Vaughn, Herchel A.; and Someshwar, Ashok H., to Motorola, Inc. Control state sequencer. 4,519,033, Cl. 364-200.000.
Vaupel, Knut; and Schulz, Peter, to Bergwerksverband GmbH. System for pumping suspended particles upward. 4,518,286, Cl. 406-46.000.
Velling, Gunther; Schrader, Lothar; and Schumacher, Hermann, to Rheinische Braunkohlenwerke AG. Reactor for the gasification of solid carbonaceous materials. 4,518,567, Cl. 422-143.000.
Veltri, Robert W., to National Foundation for Cancer Research, Inc. 2-Furylbutyrolactone modulation of the immune system in mammals. 4,518,611, Cl. 514-470.000.
Venetz, Louis M. Animal trap holder. 4,517,762, Cl. 43-96.000.
Venkatesan, Thirumalai N. C., to AT&T Bell Laboratories. Optical bistable device. 4,518,934, Cl. 332-7.510.
Verhoeven, Herman K. M.: *See*—
Lambrechts, Eric G. Y.; Verhoeven, Herman K. M.; and Claes, Constant J. P., 4,518,160, Cl. 271-214.000.
Verktygsingustri I Blidsberg Aktiebolag: *See*—
Andersson, Karl Erik E., 4,517,879, Cl. 92-136.000.
Vernet, Gilles: *See*—
Foulard, Jean; Rimbert, Jean F.; Vernet, Gilles; and Goursat, Albert-Gilbert, 4,518,421, Cl. 75-49.000.
Vernon-Carus Limited: *See*—
Carus, Edmund H.; and White, Eric F. T., 4,517,793, Cl. 57-243.000.
Verosol USA Inc.: *See*—
Judkins, Ren S., 4,518,025, Cl. 160-84.00R.
Vester, Rudolph P., to Brown & Williamson Tobacco Corporation. Ventilated filter and smoke dispersing mouthpiece. 4,517,996, Cl. 131-339.000.
Vetter, Kurt, to Hermann Behr & Sohn GmbH & Co. Sprayer. 4,518,119, Cl. 239-223.000.
Vicic, John C.; La Velle, Carl A.; and Parris, Joe P., III, to Cameron Iron Works, Inc. Ram-type blowout preventer and packer therefor. 4,518,144, Cl. 251-1.00A.
Victor Company of Japan, Limited: *See*—
Sugiyama, Hiroyuki, 4,519,062, Cl. 369-126.000.
Vielstich, Gunter: *See*—
Schudlich, Kurt; Vielstich, Gunter; Muhlenbeck, Josef; Otto, Josef; Bauer, Hannsgeorg; Zollner, Dieter H.; and Rittmann, Friedrich, 4,518,365, Cl. 445-67.000.
Viesturs, Eric A., to Connecticut Artcraft Corporation. Body support apparatus. 4,517,693, Cl. 5-451.000.
Vigo, Gilles: *See*—
Canadas, Jean C.; and Vigo, Gilles, 4,518,192, Cl. 296-97.00H.
Vikmon nee Kiraly, Maria: *See*—
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.
Virag, Sandor: *See*—
Szejtli, Jozsef; Stadler nee Szoke, Agnes; Vikmon nee Kiraly, Maria; Korbonits, Dezso; Virag, Sandor; Turcsan, Istvan; and Kiss, Pal, 4,518,588, Cl. 514-58.000.
Virea, Seppo, to A. Ahlstrom Osakeyhtio. Apparatus for treating a fibrous material. 4,518,500, Cl. 210-380.300.
Virtanen, Eero J.: *See*—
Miettinen, Jorma K.; and Virtanen, Eero J., 4,518,550, Cl. 264-46.500.
Visual Information Institute, Inc.: *See*—
Harshbarger, John H.; and Shores, William M., 4,518,995, Cl. 358-139.000.
Vize, Richard J.: *See*—
Tindall, Gary W.; Lysenko, George P.; Vize, Richard J.; Kiefer, Edward H.; and Smith, Richard J., 4,518,195, Cl. 296-148.000.
Voest-Alpine Aktiengesellschaft: *See*—
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; and Mullner, Paul, 4,518,417, Cl. 75-10.00R.
Lugscheider, Walter; Riegler, Ernst; and Zajicek, Ernst, 4,518,419, Cl. 75-11.000.
Vogel, Friedrich: *See*—
Ernst, Hansgeorg; Vogel, Friedrich; and Paust, Joachim, 4,518,813, Cl. 570-241.000.
Vogel, Peter, to Ardo International Marketing. Anti-decubitus water-floatation system. 4,517,692, Cl. 5-451.000.
Vogelsberg, Walter, to Cybersonic Corporation. Industrial control, communications and information system. 4,519,027, Cl. 364-185.000.
Vogt, Wilhelm. Process for making acetic anhydride. 4,518,539, Cl. 260-549.000.
Vokey, David E., to Canada Wire and Cable Limited. Method and apparatus for manufacturing cables having composite shield and armor sheath designs. 4,518,034, Cl. 156-54.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Bortz, Botho; and Wulfes, Erwin, 4,518,172, Cl. 280-751.000.
Kruger, Hermann, 4,517,938, Cl. 123-190.00E.
Papez, Stanislav, 4,517,934, Cl. 123-90.170.
Volpenhein, Robert A., to Proctor & Gamble Company, The. Synthesis of higher polyol fatty acid polyesters using high soap:polyol ratios. 4,518,772, Cl. 536-119.000.
von der Heide, Johann: *See*—
Elsaesser, Dieter; von der Heide, Johann; Muller, Rolf; and Papst, Georg, 4,519,010, Cl. 360-97.000.
von Othegraven, Achim. Apparatus for stretching and strengthening the back muscles. 4,517,966, Cl. 128-75.000.
Vornberger, Walter, to International Shoe Machine Corporation. Adhesive applicator. 4,517,697, Cl. 12-10.500.
Vosteen, Robert E. High voltage amplifier. 4,518,924, Cl. 330-51.000.
Vsesojuzny Nauchno-Issledovatelsky I Exerimentalno-Konstruktorsky Institut Prodovol-Stvennogo Mashinostroenia: *See*—
Braginsky, Yakov I.; Gultsev, Igor V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; and Yaroshenko, Yury F., 4,517,707, Cl. 17-71.000.
Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievo Magnievoi I Elektrodnoi Promyshlennosti: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Tekhniki: *See*—
Baldenko, Dmitry F.; Gusman, Moisei T.; and Semenets, Valery I., 4,518,049, Cl. 175-107.000.
Vuorio, Tauno A., to Siebtuchfabrik AG. Paper machine screen. 4,518,644, Cl. 428-198.000.
W. C. Pursley Limited: *See*—
Calhoun, L. Owen, 4,517,777, Cl. 52-126.200.
W. Schlafhorst & Co.: *See*—
Rohner, Joachim, 4,518,136, Cl. 242-35.50A.
Waaben, Sigurd G.: *See*—
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Wachi, Akira; and Hayashi, Munehisa, to Ohkura Electric Co., Ltd. Thermal mass flow meter. 4,517,838, Cl. 73-204.000.
Wada, Fumio: *See*—
Asami, Kazutomo; Wada, Fumio; Ishijima, Koji; and Sato, Yutaka, 4,518,330, Cl. 418-63.000.
Wada, Yasuyoshi: *See*—
Makishima, Takao; Inaba, Shigeru; and Wada, Yasuyoshi, 4,518,099, Cl. 221-30.000.
Waddill, Harold G.; and Schulze, Heinz, to Texaco Inc. Epoxy resin curatives. 4,518,749, Cl. 525-504.000.
Waddill, Harold G.: *See*—
Cuscurida, Michael; Waddill, Harold G.; and Peterson, Bruce W., 4,518,720, Cl. 521-156.000.
Wagner, Kuno: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Riberi, Bernd; and Frohlich, Jurg, 4,518,761, Cl. 528-67.000.
Wagner, Thomas R., to United Technologies Corporation. Electrical switch for induction heating system. 4,518,837, Cl. 200-81.00R.
Wahlmann, Ernst; and Klausing, Karl-Heinz, to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG. Rear seat for use in a motor vehicle. 4,518,201, Cl. 297-316.000.
Wakatsuki, Susumu, to Fuji Xerox Co., Ltd. Sheet folding machine. 4,518,381, Cl. 493-444.000.
Walker, Derek: *See*—
Cundall, Robert L.; and Walker, Derek, 4,518,773, Cl. 544-16.000.
Walker, James D.; Underhill, Kenneth R.; and Campbell, Willis R., to Sperry Corporation. Twine cutting and clamping apparatus for a roll baling machine. 4,517,889, Cl. 100-5.000.
Walker, James D.: *See*—
Campbell, Willis R.; and Walker, James D., 4,517,890, Cl. 100-5.000.
Walker, John A.: *See*—
Jensen, Ronald N.; and Walker, John A., 4,518,313, Cl. 416-18.000.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Male oral contraceptive N-alkylimidazole derivatives, compositions, and method of use therefor. 4,518,607, Cl. 514-399.000.
Wall, Ronald E., to Marine Concepts of America. Stopper for braided line. 4,517,759, Cl. 43-7.000.
Walling, Jorg-Hein; Shannon, Michael A.; and Arbuthnot, Gerald, to Northern Telecom Limited. Production of insulated electrical conductors. 4,518,633, Cl. 427-120.000.
Wallsom, Richard E.: *See*—
Bush, Harold G.; and Wallsom, Richard E., 4,518,277, Cl. 403-102.000.
Walsh, Thomas A., to Hewlett-Packard Company. Dip soldering apparatus and method. 4,518,114, Cl. 228-180.100.
Walters, Stephen M.: *See*—
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Walton, Lawrence J.: *See*—
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Wan, K. Ming: *See*—
Chen, Clay T.; Wan, K. Ming; and Chen, Mary S., 4,518,792, Cl. 560-163.000.

Wang, David W.; and Draney, Daniel R., to American Cyanamid Company. N,N,N',N'-tetraglycidyl-1,3-propylene bis(p-aminobenzoate. 4,518,786, Cl. 549-552.000.
Wang, Richard H. S.; and Myers, Garry L., to Eastman Kodak Company. Preparation of 2,5-dichlorohydroquinone. 4,518,808, Cl. 568-765.000.
Wang, Robert C.; Sampson, Arthur J.; and Persinko, Mark M., to Chicopee. Soil releasing textiles containing fluorochemical soil release agents and method for producing same. 4,518,649, Cl. 428-284.000.
Wanke, Wilhelm: *See*—
Hauser, Ludwig; and Wanke, Wilhelm, 4,518,460, Cl. 162-361.000.
Ward, John W., to Eastman Kodak Company. Light guide reflectometer. 4,518,259, Cl. 356-446.000.
Ward, Michael J.: *See*—
Chu, David C.; and Ward, Michael J., 4,519,091, Cl. 377-44.000.
Warmann, Bruno D. Label dispensing apparatus. 4,518,450, Cl. 156-566.000.
Warner, Andrew; and Zlotek, David A., to Klimsch/Optronics, Inc. Frequency synthesizer and method. 4,518,920, Cl. 328-14.000.
Warner, Andrew, to Klimsch/Optronics, Inc. Method and apparatus for producing a time advanced output pulse train from an input pulse train. 4,518,998, Cl. 358-208.000.
Warner-Lambert Company: *See*—
Cherukuri, Subraman R.; Marschall-Helman, Ellen; and Hriscisce, Frank T., 4,518,615, Cl. 426-4.000.
Eoga, Anthony B. J., 4,518,520, Cl. 252-174.230.
Scheurer, Heinrich P.; and Ong, Kenneth K. H., 4,518,768, Cl. 528-483.000.
Warren, James D.: *See*—
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Watanabe, Hiroaki. Correction tape take-up spool assembly for typewriter. 4,518,128, Cl. 242-71.800.
Watanabe, Masaru; Sakai, Toshihide; and Takase, Toshio, to Fuji Heavy Industries Ltd. Ventilating device for a container. 4,517,882, Cl. 98-6.000.
Watanabe, Mitsuru: *See*—
Taguchi, Shunichi; Ohkawa, Shuji; Watanabe, Mitsuru; and Kikuchi, Itsuo, 4,518,839, Cl. 219-10.55B.
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, to Konishiroku Photo Industry Co., Ltd. Developing material for electrophotography, process for preparation. 4,518,674, Cl. 430-108.000.
Waters, Edwin R.: *See*—
Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., 4,517,740, Cl. 29-857.000.
Waters, George F., to Codman & Shurtleff, Inc. Automatic magnification changer for a surgical microscope. 4,518,223, Cl. 350-254.000.
Watkins, Dennis W., to AirSensors, Inc. Apparatus and method for tensioning resistive wire. 4,517,735, Cl. 29-621.000.
Watkins, Richard L., to Gates Data Products, Inc. Conductive elastomeric ink composition. 4,518,833, Cl. 200-5.00A.
Wavin B.V.: *See*—
Leloux, Arnoldus W. J., 4,517,868, Cl. 83-54.000.
Weaver, Joe T. Wear resistant pump valve. 4,518,329, Cl. 417-566.000.
Weber, Eugen: *See*—
Wright, Harry D.; Hale, John M.; and Weber, Eugen, 4,518,477, Cl. 204-415.000.
Weber, Karl-Heinz; Beckmann, Wolfgang; and Gebauer, Hartmut, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH. Control system for longwall mining roof supports. 4,518,285, Cl. 405-302.000.
Weber, Klaus, to Carl-Zeiss-Stiftung. Universal binocular tube for microscopes. 4,518,230, Cl. 350-511.000.
Weber, Lawrence W.: *See*—
Buckner, Arthur B.; Davies, Michael L.; and Weber, Lawrence W., 4,517,880, Cl. 98-1.000.
Weber, T. Jerome, to GCA Corporation. Apparatus for baking resist on semiconductor wafers. 4,518,848, Cl. 219-388.000.
Weber Technical Products, Division of Craig Systems Corporation: *See*—
Lough, Wendell J.; and Bishop, Donald E., 4,518,405, Cl. 55-385.00A.
Wecker, Sheldon M., to James River-Norwalk, Inc. Process for skin foam. 4,518,557, Cl. 264-45.900.
Wedge, Philip J.; and Bridson, Robert C., to British Gas Corporation. Fuel fired burner assembly. 4,518,348, Cl. 431-265.000.
Wegener, Jack. Air pallet having multiple entry integrated air inlet valves. 4,517,690, Cl. 5-81.00R.
Wehmeyer, Donald T.; and Barnhart, Ronald W., to Economy Engineering, Inc. Translating mobile work platform. 4,518,061, Cl. 187-18.000.
Weinhold, Friedrich: *See*—
Krappitz, Heinz; Carstensen, Hans-Peter; and Weinhold, Friedrich, 4,517,829, Cl. 73-49.800.
Weisenberger, Johannes M.: *See*—
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Weisenberger, Johannes-Maximilian: *See*—
Narr, Berthold; Nickl, Josef; Muller, Erich; Roch, Josef; Haarmann, Walter; and Weisenberger, Johannes-Maximilian, 4,518,597, Cl. 514-228.000.
Weiss, Albrecht: *See*—
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Weiss, Martin J.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,518,790, Cl. 560-118.000.
Weissman, Walter: *See*—
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Welcon Connector Company: *See*—
Negley, Loren E., 4,518,209, Cl. 339-14.00R.
Welding Institute, The: *See*—
Needham, James C., 4,518,844, Cl. 219-137.0PS.
Wellauer, John C.: *See*—
Mitchell, Thomas L.; McMahill, Patrick D.; Valbert, Gary G.; and Wellauer, John C., 4,518,276, Cl. 403-13.000.
Weller, Sol W., to United States of America, Energy. Liquefaction with microencapsulated catalysts. 4,518,478, Cl. 208-8.0LE.
Wendl, Daniel P.: *See*—
Rudolph, Ronald M.; and Wendl, Daniel P., 4,517,748, Cl. 33-180.0AT.
Wennerberg, Arnold N., to Standard Oil Company (Indiana). Metal-containing active carbon and methods for making and using same. 4,518,488, Cl. 208-216.00R.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Haberli, Peter, 4,517,899, Cl. 102-521.000.
Werner, Peter, to Siemens Aktiengesellschaft. Multipole high voltage circuit breaker. 4,518,838, Cl. 200-303.000.
Wesley, William M. Inductive adaptor/generator for diesel engines. 4,517,833, Cl. 73-119.00A.
West, Harold H.; Johnson, Roger A.; and Clark, Charles W., Jr., to Ederer Incorporated. Safety mechanism for hoisting drums. 4,518,153, Cl. 254-274.000.
Westerman, Charles W., to Ford Aerospace & Communications Corporation. Tapered-width leaky-waveguide antenna. 4,518,967, Cl. 343-771.000.
Western Digital Corporation: *See*—
Hull, Richard W.; and Teslenko, Leonard, 4,519,086, Cl. 375-120.000.
Western Gear Corporation: *See*—
Bossler, Robert B., Jr., 4,518,287, Cl. 409-26.000.
Westfall, Leonard J., to United States of America, National Aeronautics and Space Administration. Arc spray fabrication of metal matrix composite monotape. 4,518,625, Cl. 427-37.000.
Westinghouse Electric Corp.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,518,843, Cl. 219-121.0LC.
Longenecker, Kenneth G.; and Geary, Thomas B., 4,518,983, Cl. 357-81.000.
Oates, Robert M.; Petronio, Carlo F.; and Kraus, Mark G., 4,518,917, Cl. 324-207.000.
Surana, Bhupendra S.; and Snedden, William H., 4,519,039, Cl. 364-469.000.
Whalen, Thomas D.: *See*—
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Wheeler, Edward L.: *See*—
Batorewicz, Wadim; and Wheeler, Edward L., 4,518,803, Cl. 564-410.000.
Wheeler, Rex W. Circuit breaker warning device. 4,518,957, Cl. 340-639.000.
Whirl-Air-Flow Corporation: *See*—
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Whirlpool Corporation: *See*—
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White, Eric F. T.: *See*—
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White, Kirk E. Convertible cushion furniture. 4,518,203, Cl. 297-456.000.
White, Robert N.: *See*—
Uffner, William E.; and White, Robert N., 4,518,741, Cl. 525-54.500.
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Whittlesey, Curtis C.; Henriksen, Gary L.; Keryluk, Walter B.; and Wolff, Merle T., to Energy Development Associates, Inc. Comb-type bipolar stack. 4,518,664, Cl. 429-38.000.
Whittlesey, Curtis C.: *See*—
Kodali, Satyanarayana; Singh, Bhim S.; Whittlesey, Curtis C.; and Henriksen, Gary L., 4,518,663, Cl. 429-18.000.
Wiart, Albert, to Jeumont-Schneider Corporation. Control circuit of a synchronous motor with two induction windings. 4,518,908, Cl. 318-723.000.
Wiegardt, Gordon K.; Hanks, Thomas W.; and Kittle, Carl E., to Deere & Company. Vehicle with control system for raising and lowering implement. 4,518,044, Cl. 172-7.000.
Wilcox, Raymond J.; and Powers, Earl W., to Republic Corporation. Mine roof bearing plate with embossed area having conical and cylindrical sections. 4,518,282, Cl. 405-259.000.
Wilder, Charles R. Carbon black and process for preparing same. 4,518,434, Cl. 106-307.000.
Wile, George J.; and Griesdorn, Carl P., to Planet Products Corporation. Silk screen printing with the curing of polymerizable liquids. 4,517,893, Cl. 101-123.000.

Wilke, Howard C.: *See*—
Copas, Gordon A.; Wilke, Howard C.; and Dykema, Dennis A., 4,518,021, Cl. 141-172.000.

Wilkens, Christian, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitted ware with reinforcing threads. 4,518,640, Cl. 428-102.000.

Wilkinson, Richard L.; and Giddings, Gary M., to Discovision Associates. Extended play videodisc. 4,519,004, Cl. 358-342.000.

Williams, Robert D.; and Mastin, James, to Deflecta-Shield Corporation. Air current deflector shield and bracket combination. 4,518,191, Cl. 296-91.000.

Willoughby, Michael D., to United States Gypsum Company. Method for forming a lightweight cementitious structural product and product formed thereby. 4,518,652, Cl. 428-312.400.

Wilson, David A.: *See*—
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Wilson, John S., to Wilson Manufacturing Company. Die cutting apparatus. 4,517,873, Cl. 83-881.000.

Wilson Manufacturing Company: *See*—
Wilson, John S., 4,517,873, Cl. 83-881.000.

Wilson, Mildred N.; Danielson, Robert L.; Bosco, Peter M.; and Steensen, Wayne L., to Nabisco Brands, Inc. Dry mix for preparation of pie and pastry fillings. 4,518,622, Cl. 426-578.000.

Winderlich, Hans-Georg: *See*—
Stockburger, Hermann; and Winderlich, Hans-Georg, 4,518,852, Cl. 235-381.000.

Windsor, Harry M., to Automotive Products Limited. Clutch control means. 4,518,064, Cl. 192-3.580.

Wineman, Arthur L.: *See*—
Gillett, James E.; Garner, Daniel C.; Wineman, Arthur L.; and Robey, Robert M., 4,517,927, Cl. 122-510.000.

Winsead, Thomas W., to Maryland Cup Corporation. Drink-through container lid with removable drink-through section. 4,518,096, Cl. 220-268.000.

Wirz, Walter: *See*—
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Wiseman, Alan G.; and Huberts, John T., to Varian Associates, Inc. Sample handling method and apparatus. 4,517,850, Cl. 73-864.210.

Wisnouskas, Joseph S.: *See*—
Peterson, John A.; Saran, Mohan S.; and Wisnouskas, Joseph S., 4,518,573, Cl. 423-303.000.

Witten, Hans J. Aerodynamic side panels for a tractor-trailer truck. 4,518,188, Cl. 296-1.00S.

Wnukiewicz, Stanley A., Jr.: *See*—
Taylor, Charles F.; Wnukiewicz, Stanley A., Jr.; and Gattiker, Anton, 4,518,240, Cl. 354-312.000.

Wolcott, Richard A., to Dow Chemical Company, The. Treatment of contaminated Stretford solution. 4,518,504, Cl. 210-670.000.

Wolf, Erwin: *See*—
Kuhlmann, Gerhard; and Wolf, Erwin, 4,517,869, Cl. 83-100.000.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Process and apparatus for correlating startup and cutoff periods of different induction motors with one another. 4,518,899, Cl. 318-68.000.

Wolfe, William R., Jr., to Du Pont de Nemours, E. I., and Company. Microwave absorber. 4,518,651, Cl. 428-308.800.

Wolff, Merle T.: *See*—
Whittlesey, Curtis C.; Henriksen, Gary L.; Keryluk, Walter B.; and Wolff, Merle T., 4,518,664, Cl. 429-38.000.

Wolters, Leendert, to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek. System for the use of gas as secondary fuel in diesel engines. 4,517,928, Cl. 123-27.0GE.

Wong, David: *See*—
Richmond, Iain J.; Wong, David; Puust, Ants; and Oldham, James A., 4,517,903, Cl. 110-233.000.

Wong, Stephen S.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Stephen S., 4,518,485, Cl. 208-89.000.

Wood, Robert S., to Plessey Overseas Limited. Pressure loaded gear pump. 4,518,331, Cl. 418-132.000.

Woodall, Jerry M. P.: *See*—
Dumke, William P.; and Woodall, Jerry M. P., 4,518,979, Cl. 357-30.000.

Woodcock, Brian: *See*—
Penny, Michael F.; Woodcock, Brian; Abbot, Ralph H.; Phillips, David M.; and Spaans, Leendert B., 4,518,254, Cl. 356-5.000.

Woodson, Wayne D., to CL Industries, Inc. Curable epoxy resin compositions and use in preparing formed, shaped, filled bodies. 4,518,723, Cl. 523-466.000.

Woodstream Corporation: *See*—
Mayer, Oscar C., Jr., 4,518,083, Cl. 206-340.000.

Woodward, Robert B.: *See*—
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,518,533, Cl. 260-245.400.

Wooldridge, George A., to United Technologies Automotive, Inc. Control pod and switch assembly. 4,518,836, Cl. 200-61.540.

Worf, Douglas L. Heat exchange system. 4,517,958, Cl. 126-429.000.

Worthington, Paul A.: *See*—
Marchington, Anthony F.; Lewis, Timothy; Clough, John M.; Worthington, Paul A.; and Dalziel, John, 4,518,415, Cl. 71-92.000.

Wright, Harry D.; Hale, John M.; and Weber, Eugen, to Orbisphere Corporation Wilmington. Thermal protection for electroanalytical cell and amperometric probe. 4,518,477, Cl. 204-415.000.

Wu, Stephen H.; and Dannelly, Clarence C., to Eastman Kodak Company. Fractionation of polymers. 4,518,769, Cl. 528-486.000.

Wuerzer, Bruno: *See*—
Schirmer, Ulrich; Plath, Peter; and Wuerzer, Bruno, 4,518,414, Cl. 71-90.000.

Wulfes, Erwin: *See*—
Bortz, Botho; and Wulfes, Erwin, 4,518,172, Cl. 280-751.000.

Wynnyckyj, John R., to University of Waterloo. Production of magnesium metal. 4,518,425, Cl. 75-67.00R.

XCP, Inc.: *See*—
Rademacher, Darrell; Neville, Thomas; and Simpson, Roger T. (said Darrell Rademacher and Thomas Neville assors. to), 4,519,088, Cl. 377-16.000.

Xerox Corporation: *See*—
Bares, Jan, 4,518,245, Cl. 355-3.0DD.
Frey, Thomas M.; and Kovnat, Larry A., 4,519,000, Cl. 358-301.000.
Henry, Arnold W.; Azar, Jack C.; and Sagal, John, 4,518,655, Cl. 428-329.000.
Lehman, Richard F., 4,518,895, Cl. 315-117.000.

Xomox Corporation: *See*—
Gardner, John F.; and Hobson, David, 4,518,149, Cl. 251-144.000.

Yabiki, Akira; Imanishi, Norio; Shibata, Yoji; Kosuge, Wataru; and Yukawa, Nobumichi, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Buffer memory dispersion type video/audio transmission system with spatially and timewise divided inter-office junction lines. 4,518,989, Cl. 358-86.000.

Yagi, Eiji; Kobari, Yuji; and Takahashi, Sadahiro, to Nissan Motor Company, Limited. Pump-drive device of power-assisted steering system. 4,518,055, Cl. 180-142.000.

Yagihara, Morio; Ikegawa, Akihiko; Ono, Mitsunori; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,518,685, Cl. 430-505.000.

Yamada, Kazuhiro: *See*—
Ishikawa, Yasuhiro; Yamada, Kazuhiro; and Kida, Masashi, 4,518,733, Cl. 524-274.000.

Yamada, Makoto; Kubota, Tatsushi; and Kojima, Ikuzo, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Takai-Pika-Denki-Seisakusho. Ring joint for seatbelt system. 4,518,173, Cl. 280-806.000.

Yamada, Shinjiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Locking device. 4,518,181, Cl. 292-201.000.

Yamada, Shozo: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, 4,518,712, Cl. 514-255.000.

Yamaguchi, Tatsuo: *See*—
Aoshima, Atsushi; Suzuki, Yoshio; Yamamatsu, Setsuo; and Yamaguchi, Tatsuo, 4,518,796, Cl. 560-208.000.

Yamaguchi, Yoshio: *See*—
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Yamaguchi, Yutaka; Koizumi, Nobuyuki; Hirano, Masami; Araki, Tamio; and Kojima, Koichi, to Bridgestone Tire Company Limited. Pneumatic tire. 4,518,023, Cl. 152-361.0FP.

Yamaha Hatsudoki Kabushika Kaisha: *See*—
Takayasu, Hidekazu, 4,518,540, Cl. 261-18.00B.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamakawa, Goichi: *See*—
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,518,674, Cl. 430-108.000.

Yamamatsu, Setsuo: *See*—
Aoshima, Atsushi; Suzuki, Yoshio; Yamamatsu, Setsuo; and Yamaguchi, Tatsuo, 4,518,796, Cl. 560-208.000.

Yamamoto, Akihiro: *See*—
Shibata, Akira; Hirose, Koichi; and Yamamoto, Akihiro, 4,519,005, Cl. 360-65.000.

Yamamoto, Masaaki: *See*—
Matsuo, Tadao; Matsuoka, Fumio; Yokota, Nobuo; and Yamamoto, Masaaki, 4,518,552, Cl. 264-126.000.

Yamamoto, Masahiko; Nishino, Yoshinori; Komura, Akio; and Ebisu, Tomio, to Hitachi Shipbuilding & Engineering Co. Ltd. Method for molding bent pipes made up of composite material. 4,518,556, Cl. 264-295.000.

Yamamoto, Shigehiko: *See*—
Taguchi, Sadanori; Aida, Toshiyuki; Yamamoto, Shigehiko; and Honda, Yukio, 4,518,890, Cl. 313-346.00R.

Yamamoto, Takayoshi: *See*—
Yoshida, Hisayoshi; Ogawa, Ichitaro; Hagio, Tsuyoshi; Kobayashi, Kazuo; and Yamamoto, Takayoshi, 4,518,702, Cl. 501-90.000.

Yamamoto, Yoshihiro: *See*—
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, 4,518,398, Cl. 51-309.000.

Yamamoto, Yoshikazu. Domestic pets' chamberpot. 4,517,920, Cl. 119-1.000.

Yamamuro, Kiyoshi: *See*—
Imose, Kazuo; Yamamuro, Kiyoshi; Takeuchi, Hironori; and Misawa, Takashi, 4,518,962, Cl. 340-870.280.

Yamanishi, Akio; and Sato, Kanichi, to Kabushiki Kaisha Komatsu Seisakusho. Method for making molds. 4,518,031, Cl. 164-526.000.

Yamashita, Kunio: *See*—
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Tanaka, Hirotoshi, 4,518,868, Cl. 307-306.000.

Yamauchi Rubber Industry Co., Ltd.: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,517,719, Cl. 29-124.000.

Yamauchi, Shiro: *See*—
Nakahori, Ichiro; Nakayama, Shigeki; Maeda, Mitsuo; Yamauchi, Shiro; and Ozawa, Junichiro, 4,517,849, Cl. 73-863.310.
Yamauchi, Teruo: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; Fujieda, Mamoru; Nishimura, Yutaka; Sasayama, Takao; Sakamoto, Shinichi; Moriya, Hisanori; Atago, Takeshi; Sato, Kanemasa; Hoshi, Yoshikazu; Ueno, Sadayasu; Otani, Tadahiko; and Kashiwaya, Mineo, 4,517,837, Cl. 73-202.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,518,815, Cl. 136-244.000.
Yamazaki, Tomio: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yamazaki, Tomio; Yamada, Shozo; and Honna, Takaji, 4,518,712, Cl. 514-255.000.
Yamazaki, Toshinori: *See*—
Matsuzaki, Masatoshi; Yamazaki, Toshinori; and Nomori, Hiroyuki, 4,518,670, Cl. 430-58.000.
Yanadori, Michio: *See*—
Kamohara, Hideaki; Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, 4,518,514, Cl. 252-70.000.
Yanagida, Tuneo, to Olympus Optical Co., Ltd. Recording medium and recording-reproduction system provided with the recording medium. 4,518,657, Cl. 428-450.000.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; and Yanagishima, Takayuki, 4,518,954, Cl. 340-576.000.
Yanaihara, Noboru: *See*—
Numa, Shosaku; and Yanaihara, Noboru, 4,518,527, Cl. 260-112.50R.
Yano, Takeshi; Fukui, Izumu; Hamatsuki, Takeshige; Sato, Eiichi; and Inui, Osamu, to NEC Corporation. Differential lever actuator including differentially force-transmitting members which are not liable to break. 4,518,887, Cl. 310-328.000.
Yao-Psong, Wang. Multi-purpose instructing block. 4,518,359, Cl. 434-195.000.
Yarbrough, Roger L., to Sulcon, Inc. Method of overlaying sulphur concrete on horizontal and vertical surfaces. 4,518,548, Cl. 264-32.000.
Yaron, Giora: *See*—
Priel, Ury; Yaron, Giora; and Ebel, Mark S., 4,519,076, Cl. 371-21.000.
Yaroshenko, Yury F.: *See*—
Braginsky, Yakov I.; Gultsev, Igor V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; and Yaroshenko, Yury F., 4,517,707, Cl. 17-71.000.
Yarossi, Mary E.; and Trevisan, Carey S., to American Cyanamid Company. Process for producing a wax-like stick product. 4,518,553, Cl. 264-234.000.
Yarwood, John C.: *See*—
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,518,030, Cl. 164-503.000.
Yashiki, Yuichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,518,669, Cl. 430-57.000.
Yasukawa, Kazuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Head for industrial robot. 4,518,298, Cl. 414-4.000.
Yasukuni, Mitsuo, to Minolta Camera Kabushiki Kaisha. Telephoto lens system. 4,518,229, Cl. 350-454.000.
Yasuno, Mitsuo: *See*—
Nagaoka, Mitsuru; and Yasuno, Mitsuo, 4,517,859, Cl. 74-866.000.
Yasutake, Kousuke, to Honda Giken Kogyo Kabushiki Kaisha. Crank shaft of V-type internal-combustion engine. 4,517,933, Cl. 123-55.0VF.
Yeas, John A., to Reference Technology. Disc latching mechanism. 4,519,060, Cl. 369-77.200.
Ye, Shem D. Device for temporarily isolating an additive in a beverage container. 4,518,082, Cl. 206-217.000.
Yokohama Rubber Co., Ltd., The: *See*—
Ishikawa, Yasuhiro; Yamada, Kazuhiro; and Kida, Masashi, 4,518,733, Cl. 524-274.000.
Yokoshima, Naohiko; Masumoto, Nobuyoshi; and Sui, Akira. Method of producing seal ring. 4,517,726, Cl. 29-527.400.
Yokota, Mitsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Pressure sustaining apparatus. 4,518,316, Cl. 417-12.000.
Yokota, Mitsuyoshi: *See*—
Matsumoto, Akio; and Yokota, Mitsuyoshi, 4,518,903, Cl. 318-481.000.
Yokota, Nobuo: *See*—
Matsuo, Tadao; Matsuoka, Fumio; Yokota, Nobuo; and Yamamoto, Masaaki, 4,518,552, Cl. 264-126.000.
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials with antistatic layer containing nonionic surface active agent. 4,518,354, Cl. 430-527.000.
Yokozeki, Shinichi; Kimura, Masami; and Tsukagoshi, Tsunehiro, to Pioneer Electronic Corporation. Acoustic diaphragm. 4,518,443, Cl. 148-400.000.
Yorozu, Arthur S.: *See*—
Eggebrecht, John L.; Rogers, Harold D.; and Yorozu, Arthur S., 4,517,813, Cl. 62-284.000.
Yoshida, Haruo; Tagoshi, Hirotaka; Morohashi, Yasushi; and Tanikoshi, Toshiaki, to Showa Denko Kabushiki Kaisha; and Showa High-polymer Co., Ltd. Biphenyloxy mono- and dimethacrylate polymerizable compositions. 4,518,756, Cl. 526-313.000.
Yoshida, Hisayoshi; Ogawa, Ichitaro; Hagio, Tsuyoshi; Kobayashi, Kazuo; and Yamamoto, Takayoshi, to Director-General of the Agency of Industrial Science and Technology. Silicon carbide-boron carbide carbonaceous body. 4,518,702, Cl. 501-90.000.
Yoshida Industry Co., Ltd.: *See*—
Hatakeyama, Yoshiharu; Ishikawa, Tatsuo; and Teshima, Kenzo, 4,518,554, Cl. 264-262.000.
Yoshida, Kenichi: *See*—
Shiga, Tetsuya; Okawa, Shinichi; Yoshida, Kenichi; and Hiramoto, Junichi, 4,517,982, Cl. 128-635.000.
Yoshida, Mikihiko: *See*—
Miyake, Toshio; Yoshida, Mikihiko; and Takeuchi, Kano , 4,518,581, Cl. 424-48.000.
Yoshida, Shusuke; Nakajima, Tamotsu; and Okamoto, Miyoshi, to Toray Industries, Inc. Chenille woven or knitted fabric and process for producing the same. 4,517,715, Cl. 28-144.000.
Yoshida, Tadao: *See*—
Higashihara, Teruaki; Nonaka, Chiaki; Yoshida, Tadao; and Kawachi, Hideo, 4,519,057, Cl. 369-50.000.
Yoshimitsu, Yasuro: *See*—
Okubo, Masao; Yoshimitsu, Yasuro; Nakai, Fumio; and Garretson, Oliver R., 4,518,914, Cl. 324-158.00F.
Yoshioka, Kazuo: *See*—
Atsumi, Akira; Oguni, Kensaku; Kuroda, Shigeaki; Senshu, Takao; and Yoshioka, Kazuo, 4,517,811, Cl. 62-197.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Umekawa, Osamu; and Katayama, Sakae, 4,518,610, Cl. 514-516.000.
Young, Dean A., to Union Oil Company of California. Crystalline silicate catalysts. 4,518,703, Cl. 502-63.000.
Youngblood, Harold C.; and Champeau, Kenneth L. Retrievable well tool. 4,518,037, Cl. 166-125.000.
Yu, Ruey J.; and Van Scott, Eugene J. Phenyl alpha-acyloxyacetamide derivatives and their therapeutic use. 4,518,789, Cl. 560-105.000.
Yuasa, Yoshio; and Kawagoe, Nobukazu, to Minolta Camera Kabushiki Kaisha. Exposure control device for a photographic enlarger. 4,518,250, Cl. 355-69.000.
Yuhas, Donald E.: *See*—
Kessler, Lawrence W.; and Yuhas, Donald E., 4,518,992, Cl. 358-112.000.
Yukawa, Nobumichi: *See*—
Yabiki, Akira; Imanishi, Norio; Shibata, Yoji; Kosuge, Wataru; and Yukawa, Nobumichi, 4,518,989, Cl. 358-86.000.
Yuter, Seymour C. Restaurant telephone entertainment system. 4,518,821, Cl. 179-2.00R.
Yuzawa, Haruo: *See*—
Ishigami, Kazuhiro; Furuhashi, Shoji; and Yuzawa, Haruo, 4,517,945, Cl. 123-425.000.
Zabala, Robert J.: *See*—
Park, Dong-Sil; and Zabala, Robert J., 4,518,624, Cl. 427-34.000.
Zabcik, Clarence J., to NL Industries, Inc. Downhole apparatus for absorbing vibratory energy to generate electrical power. 4,518,888, Cl. 310-334.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Schuster, Max, 4,518,065, Cl. 192-4.00A.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,532, Cl. 260-404.500.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,518,802, Cl. 564-201.000.
Zajicek, Ernst: *See*—
Lugscheider, Walter; Riegler, Ernst; and Zajicek, Ernst, 4,518,419, Cl. 75-11.000.
Zamboni, Valentino; Brichta, Corrado; and Troglia, Claudio, to Montedison S.p.A. Process for the crystallization of high polymers in the presence of nucleant systems based on zeo lites. 4,518,731, Cl. 524-166.000.
Zaruba, John V.; and Meyer, Burton C., to Marvin Glass & Associates. Figure including means for extruding plastic substance. 4,518,367, Cl. 446-373.000.
Zatulovsky, Isaak A.: *See*—
Kaluzhsky, Nikolai A.; Sizyakov, Viktor M.; Andreev, Vladimir V.; Alexeev, Alexei I.; Badaliants, Khoren A.; Zatulovsky, Isaak A.; Korneev, Valentin I.; and Kostin, Ivan M., 4,518,571, Cl. 423-119.000.
Zaveri, Vikram H.: *See*—
Kluting, Bernd; and Zaveri, Vikram H., 4,518,190, Cl. 296-65.00R.
Zenith Radio Corporation: *See*—
Beckman, Orval E., 4,518,997, Cl. 358-198.000.
Zgliczynski, Marek: *See*—
Peruzzi, Federigo; and Zgliczynski, Marek, 4,518,326, Cl. 417-372.000.
Ziegler, Duane H.: *See*—
Denning, Barry K.; and Ziegler, Duane H., 4,517,792, Cl. 56-10.200.
Zimmer, Inc.: *See*—
Halcomb, F. Joseph, III; and Allen, C. Wayne, 4,517,969, Cl. 128-92.00E.
Zimpro Inc.: *See*—
Lewis, Frederick M.; and Berken, George A., 4,517,906, Cl. 110-346.000.
Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,518,899, Cl. 318-68.000.

Zirbes, James A.: *See*—
Ronco, Kenneth J.; Sommer, Robert; Nigel, Ken; Grimes, Donald; Zirbes, James A.; and Stacey, Robert E., 4,518,077, Cl. 198-731.000.

Zlab, Horst: *See*—
Bornemann, Hans-Joachim; and Zlab, Horst, 4,518,262, Cl. 366-156.000.

Zlotek, David A.: *See*—
Warner, Andrew; and Zlotek, David A., 4,518,920, Cl. 328-14.000.

Zollner, Dieter H.: *See*—
Schudlich, Kurt; Vielstich, Gunter; Muhlenbeck, Josef; Otto, Josef; Bauer, Hannsgeorg; Zollner, Dieter H.; and Rittmann, Friedrich, 4,518,365, Cl. 445-67.000.

Zuber, Bretislav P.: *See*—
Cote , Gerard G. M.; and Zuber, Bretislav P., 4,518,129, Cl. 242-78.000.

Zublin, Casper W. Hydraulic jet well cleaning assembly using a non-rotating tubing string. 4,518,041, Cl. 166-312.000.

Zuidema, Jack: *See*—
Boger, David L.; Pugh, Jerry T.; and Zuidema, Jack, 4,518,565, Cl. 422-58.000.

Zuleeg, Rainer, to McDonnell Douglas Corporation. Temperature tracking range finder. 4,518,255, Cl. 356-5.000.

Zweigart, Gerhard: *See*—
Gallitzendorfer, Joseph; Pfeiffer, Peter; Tomforde, Johann; Parisch, Jochen; and Zweigart, Gerhard, 4,518,197, Cl. 296-213.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Charles H.: *See*—
Peters, Kenneth D.; and Anderson, Charles H., Re. 31,894, Cl. 313-422.000.

Bardong, Helmut: *See*—
Nonnenmann, Manfred; and Bardong, Helmut, Re. 31,889, Cl. 165-173.000.

Kalvitis, Robert E.: *See*—
Tickner, Donald R.; and Kalvitis, Robert E., Re. 31,891, Cl. 355-75.000.

Kneip, George D., Jr., to Varian Associates, Inc. NMR spectrometer with superconducting coil having rectangular cross-section wire. Re. 31,895, Cl. 324-319.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Sugita, Hiroshi; Saito, Shizuo; Sato, Ryosuke; and Yamashita, Kiyoshi, Re. 31,893, Cl. 430-544.000.

Lowe, David J., to National Research Development Corp. Chart recorders. Re. 31,896, Cl. 346-136.000.

National Research Development Corp.: *See*—
Lowe, David J., Re. 31,896, Cl. 346-136.000.

Nonnenmann, Manfred; and Bardong, Helmut, to Suddeutsche Kuhlerfabrik Julius Fr. Behr. Heat exchanger. Re. 31,889, Cl. 165-173.000.

Peters, Kenneth D.; and Anderson, Charles H., to RCA Corporation. Modular guided beam flat display device. Re. 31,894, Cl. 313-422.000.

RCA Corporation: *See*—
Peters, Kenneth D.; and Anderson, Charles H., Re. 31,894, Cl. 313-422.000.

Saito, Shizuo: *See*—
Sugita, Hiroshi; Saito, Shizuo; Sato, Ryosuke; and Yamashita, Kiyoshi, Re. 31,893, Cl. 430-544.000.

Sato, Ryosuke: *See*—
Sugita, Hiroshi; Saito, Shizuo; Sato, Ryosuke; and Yamashita, Kiyoshi, Re. 31,893, Cl. 430-544.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr: *See*—
Nonnenmann, Manfred; and Bardong, Helmut, Re. 31,889, Cl. 165-173.000.

Sugita, Hiroshi; Saito, Shizuo; Sato, Ryosuke; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material. Re. 31,893, Cl. 430-544.000.

Tickner, Donald R.; and Kalvitis, Robert E., to Xerox Corporation. Platen module for computer fanfold reproduction. Re. 31,891, Cl. 355-75.000.

Vangedal-Nielsen, Erling. Freezing mould bag. Re. 31,890, Cl. 249-61.000.

Varian Associates, Inc.: *See*—
Kneip, George D., Jr., Re. 31,895, Cl. 324-319.000.

Xerox Corporation: *See*—
Tickner, Donald R.; and Kalvitis, Robert E., Re. 31,891, Cl. 355-75.000.

Yamashita, Kiyoshi: *See*—
Sugita, Hiroshi; Saito, Shizuo; Sato, Ryosuke; and Yamashita, Kiyoshi, Re. 31,893, Cl. 430-544.000.

LIST OF DESIGN PATENTEES

Acriform Engineering Inc.: *See*—
Burgess, John D.; and Taylor, Thomas E., 278,929, Cl. D23-56.000.

Airpax Corporation: *See*—
Harper, George S., 278,896, Cl. D13-34.000.

Allied Corporation: *See*—
Zaccai, Gianfranco D.; Wheinstone, David B.; Keramaty, Hamid; and Flynn, William E., 278,930, Cl. D24-21.000.

AMF Incorporated: *See*—
Dennis, Douglas K., 278,943, Cl. D34-19.000.

Anderson, Christine H., to Mattel, Inc. Rocking pony for a crib rail or similar article. 278,923, 5-21-85, Cl. D21-165.000.

Ando, Teturo, to Kabushiki Kaisha Taikodenki Seisakusho. Telephone. 278,903, 5-21-85, Cl. D14-53.000.

Androbot, Inc.: *See*—
Jones, Douglas H.; and Salat, Siegfried W., 278,922, Cl. D21-150.000.

Arai, Noriyuki: *See*—
Kurokawa, Koya; and Arai, Noriyuki, 278,907, Cl. D14-84.000.

Austin, Arnold S., to Quabaug Rubber Company. Shoe sole. 278,851, 5-21-85, Cl. D2-320.000.

Bagley, James L. Fishing lure. 278,926, 5-21-85, Cl. D22-27.000.

Beard, Howard R. Support arm for racks or the like. 278,875, 5-21-85, Cl. D6-566.000.

Bissonette, William M., to Security Technology Limited. Cabinet for a communication control system or the like. 278,902, 5-21-85, Cl. D14-52.000.

Blance, Andrew J.: *See*—
Laude, Michael E.; Pendleton, Thomas J.; Smith, Douglas W.; Dawson, Robert E.; and Blance, Andrew J., 278,912, Cl. D15-69.000.

Bodourian, Peter V.; and Grispino, Joseph M. Cassette container. 278,856, 5-21-85, Cl. D3-35.000.

Bohl, Rainer, to Roeder GmbH Sitzmoebelwerke. Chair. 278,869, 5-21-85, Cl. D6-366.000.

Bohnsack, Duane F., to Mid-American Industries, Inc. Aquarium. 278,941, 5-21-85, Cl. D30-8.000.

Borichevsky, Donald J., to Telescope Folding Furniture Co., Inc. Ottoman. 278,864, 5-21-85, Cl. D6-349.000.

Bozorth, Ralph. Saw blade holder. 278,877, 5-21-85, Cl. D8-71.000.

Bradley, William F. Tooth cleansing device. 278,863, 5-21-85, Cl. D4-108.000.

Bresie, Don A.; Burns, Jack M.; and Fowler, Donald W. Equipment skid. 278,944, 5-21-85, Cl. D34-28.000.

Brorsson, Bror J.-E.: *See*—
Larsson, Lars P.; and Brorsson, Bror J.-E., 278,931, Cl. D24-31.000.

Burgess, John D.; and Taylor, Thomas E., to Acriform Engineering Inc. Bathtub. 278,929, 5-21-85, Cl. D23-56.000.

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Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Silverado. 5,475, 5-21-85, Cl. 74.000.

Jenkins, Philip J., deceased (by Jenkins, Zona G., legal representative), to Stark Brothers Nurseries & Orchards Company. Red delicious apple tree—Jenred cultivar. 5,472, 5-21-85, Cl. 35.000.

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125 C 4,517,742
147 M 4,517,743
169 B 4,517,745
169 C 4,517,744
178 B 4,517,747
180 AT 4,517,748
346 4,517,749
396 4,517,750
549 4,517,746

CLASS 34

10 4,517,751
58 4,517,752

CLASS 36

128 4,517,753

CLASS 37

66 4,517,754
117.5 4,517,755
118 R 4,517,756

CLASS 38

88 4,517,757

CLASS 40

431 4,517,758

CLASS 43

7 4,517,759
21 4,517,760
21.2 4,517,761
96 4,517,762

CLASS 44

6 4,518,393
38 4,518,394
53 4,518,395

CLASS 47

58 4,517,763
77 4,517,764

CLASS 48

196 R 4,518,396

CLASS 49

3 4,517,765
417 4,517,766
464 4,517,767

CLASS 51

58 4,517,768
105 R 4,517,769
125.5 4,517,770
163.2 4,517,771
281 SF 4,517,772
293 4,518,397
309 4,518,398
336 4,517,773
436 4,517,774

CLASS 52

40 4,517,775
90 4,517,776
126.2 4,517,777
167 4,517,778
232 4,517,779
233 4,517,780
299 4,517,781
309.7 4,517,782
481 4,517,783

CLASS 53

75 4,517,784
116 4,517,785
450 4,517,786
4,517,787
459 4,517,788
545 4,517,789
552 4,517,790
566 4,517,791

CLASS 55

16 4,518,399
68 4,518,400
101 4,518,401
103 4,518,402
194 4,518,403
256 4,518,404
385 A 4,518,405

CLASS 56

10.2 4,517,792
341 4,517,795

CLASS 57

243 4,517,793
304 4,517,794

CLASS 60

39.281 4,517,796
4,517,797
39.462 4,517,798
337 4,517,800
602 4,517,801
606 4,517,802
611 4,517,803
657 4,517,804
688 4,517,805

CLASS 62

123 4,517,806
156 4,517,807
160 4,517,808
183 4,517,809
186 4,517,810
197 4,517,811
228.5 4,517,812
284 4,517,813
323.1 4,517,799
374 4,517,814
457 4,517,815

CLASS 63

12 4,517,816
26 4,517,817

CLASS 65

1 4,518,406
3.12 4,518,407
6 4,518,408
79 4,518,409
106 4,518,410
4,518,411
244 4,518,412

CLASS 68

5 E 4,517,818

CLASS 71

28 4,518,413
90 4,518,414
92 4,518,415
94 4,518,416

CLASS 72

353 4,517,819
391 4,517,820

CLASS 73

1 B 4,517,822
1 C 4,517,821
3 4,517,823
23 4,517,824
38 4,517,825
40 4,517,826
45.4 4,517,827
46 4,517,828
49.8 4,517,829
57 4,517,830
116 4,517,831
118 4,517,832
119 A 4,517,833
146.5 4,517,834
152 4,517,835
4,517,836
202 4,517,837
204 4,517,838
432 R 4,517,839
517 AV 4,517,841
644 4,517,840
701 4,517,842
707 4,517,844
847 4,517,843
861.05 4,517,845
861.12 4,517,846
861.74 4,517,847
862.52 4,517,848
863.31 4,517,849
864.21 4,517,850
864.91 4,517,851

CLASS 74

89.15 4,517,852
4,517,853
492 4,517,854
528 4,517,855
665 GA 4,517,856
4,517,857
801 4,517,858
866 4,517,859

CLASS 75

10 R 4,518,417
4,518,418
11 4,518,419
26 4,518,420
49 4,518,421
58 4,518,422
64 4,518,423
65 R 4,518,424
67 R 4,518,425
112 4,518,426
251 4,518,427
257 4,518,428

CLASS 81

57.29 4,517,861
119 4,517,862
434 4,517,863
436 4,517,864
475 4,517,865
487 4,517,860

CLASS 82

39 4,517,866
101 4,517,867

CLASS 83

54 4,517,868
100 4,517,869
411 R 4,517,870
677 4,517,871
881 4,517,873

CLASS 84

314 N 4,517,874
383 R 4,517,875
422 R 4,517,876

CLASS 85

880 4,517,872

CLASS 91

48 4,517,877
396 4,517,878

CLASS 92

136 4,517,879

CLASS 98

1 4,517,880
6 4,517,882
115.3 4,517,883
208 4,517,881

CLASS 99

276 4,517,884
421 HV 4,517,885
425 4,517,886
426 4,517,887
472 4,517,888

CLASS 100

5 4,517,889
4,517,890
88 4,517,891
292 4,517,892

CLASS 101

123 4,517,893
126 4,517,894

CLASS 102

202.2 4,517,895
342 4,517,896
439 4,517,897
514 4,517,898
521 4,517,899
529 4,517,900

CLASS 106

14.39 4,518,429
35 4,518,430
97 4,518,431
117 4,518,432
180 4,518,433
307 4,518,434
308 N 4,518,435

CLASS 109

19 4,517,901

CLASS 110

190 4,517,902
233 4,517,903
264 4,517,904
346 4,517,905
4,517,906

CLASS 112

121.15 4,517,907
129 4,517,908
275 4,517,909
439 4,517,910

CLASS 114

267 4,517,911
275 4,517,912
293 4,517,913
345 4,517,914

CLASS 116

137 R 4,517,915

CLASS 118

234 4,517,916
302 4,517,917
723 4,517,918

CLASS 119

1 4,517,919
4,517,920
16 4,517,921
29 4,517,922
51 R 4,517,923
98 4,517,924

CLASS 122

2 4,517,925
510 4,517,927

CLASS 123

3 4,517,926
27 GE 4,517,928
41.1 4,517,929
41.31 4,517,930
48 B 4,517,931
54 A 4,517,932
55 VF 4,517,933
90.17 4,517,934
90.4 4,517,935
90.5 4,517,936
190 D 4,517,937
190 E 4,517,938
198 E 4,517,939
4,517,940
336 4,517,941
376 4,517,942
415 4,517,943
425 4,517,944
4,517,945
450 4,517,946
489 4,517,947
4,517,948
4,517,949
559 4,517,950
572 4,517,951
638 4,517,952

CLASS 124

17 4,517,953

CLASS 125

15 4,517,954

CLASS 126

211 4,517,955
283 4,517,956
426 4,517,957
429 4,517,958
437 4,517,959
440 4,517,960
450 4,517,961

CLASS 127

60 4,518,436

CLASS 128

6 4,517,962
4,517,963
11 4,517,964
20 4,517,965
75 4,517,966
79 4,517,967
80 H 4,517,968
92 E 4,517,969
131 4,517,970
133 4,517,971
156 4,517,972
303.1 4,517,973
4,517,974
303.13 4,517,975
303.15 4,517,976
305 4,517,977
314 4,517,978
325 4,517,979
395 4,517,980
581 4,517,981
635 4,517,982
639 4,517,983
642 4,517,984
660 4,517,985
671 4,517,986
719 4,517,987

CLASS 131

116 4,517,988
187 4,517,989
276 4,517,990
4,517,991
304 4,517,992
329 4,517,993
4,517,994
334 4,517,995
339 4,517,996

CLASS 132

5 4,517,997
11 R 4,517,998
53 4,517,999
92 A 4,518,000

CLASS 133

5 R 4,518,001

CLASS 134

18 4,518,437
22.1 4,518,438

CLASS 135

67 4,518,002

CLASS 136

244 4,518,815

CLASS 137

65 4,518,003
116 4,518,004
207 4,518,005
218 4,518,006
337 4,518,007
552 4,518,008
571 4,518,009
587 4,518,010
596.17 4,518,011
601 4,518,012
811 4,518,013
843 4,518,014

CLASS 138

93 4,518,015
96 R 4,518,016
4,518,017
130 4,518,018

CLASS 139

1 R 4,518,019
55.1 4,518,020

CLASS 141

172 4,518,021

CLASS 148

3 4,518,439
6.14 R 4,518,440
11.5 N 4,518,442
11.5 P 4,518,441
400 4,518,443
402 4,518,444

CLASS 152

361 DM 4,518,024
361 FP 4,518,023

CLASS 156

49 4,518,445

54 4,518,034
63 4,518,446
71 4,518,447
86 4,518,448
153 4,518,449
202 4,518,451
211 4,518,452
307.5 4,518,453
541 4,518,454
566 4,518,450
613 4,518,455
626 4,518,456
656 4,518,457

CLASS 159

47.1 4,518,458

CLASS 160

84 R 4,518,025
232 4,518,026

CLASS 162

5 4,518,459
361 4,518,460

CLASS 164

435 4,518,027
460 4,518,028
463 4,518,029
503 4,518,030
526 4,518,031

CLASS 165

12 4,518,032
53 4,518,033
101 4,518,035
173 Re.31,889

CLASS 166

105 4,518,036
125 4,518,037
266 4,518,038
276 4,518,039
307 4,518,040
312 4,518,041
347 4,518,042

CLASS 172

6 4,518,043
7 4,518,044
4,518,045
311 4,518,046
611 4,518,047

CLASS 174

3 4,518,816
38 4,518,817
52 FP 4,518,818
78 4,518,819
152 GM 4,518,820

CLASS 175

61 4,518,048
107 4,518,049
250 4,518,050
4,518,051

CLASS 177

245 4,518,052

CLASS 179

2 DP 4,518,823
2 E 4,518,822
2 R 4,518,821
6.3 CC 4,518,824
11 4,518,825
37 4,518,826
81 B 4,518,829
81 R 4,518,827
4,518,828
103 4,518,830
119 A 4,518,831

CLASS 180

14.2 4,518,053
118 4,518,054
142 4,518,055
193 4,518,056
210 4,518,057
300 4,518,058

CLASS 182

2 4,518,059
230 4,518,060

CLASS 187

18 4,518,061
29 R 4,518,062

CLASS 188

196 BA 4,518,063

CLASS 192

0.052 4,518,068
0.09 4,518,067
3.58 4,518,064
4 A 4,518,065
4 C 4,518,066
60 4,518,069
85 CA 4,518,070
106.2 4,518,071

CLASS 194

4 C 4,518,073
4 D 4,518,072

CLASS 198

425 4,518,074
460 4,518,075
648 4,518,076
731 4,518,077
775 4,518,078
864 4,518,079

CLASS 200

4 4,518,832
5 A 4,518,833
16 D 4,518,834
61.45 M 4,518,835
61.54 4,518,836
81 R 4,518,837
303 4,518,838

CLASS 202

270 4,518,461

CLASS 203

39 4,518,462

CLASS 204

1 T 4,518,463
4,518,464
15 4,518,465
28 4,518,466
37.1 4,518,467
38.3 4,518,468
44.5 4,518,469
98 4,518,470
129.1 4,518,471
159.15 4,518,472
159.18 4,518,473
206 4,518,474
247 4,518,475
299 R 4,518,476
415 4,518,477

CLASS 206

39 4,518,080
158 4,518,081
217 4,518,082
340 4,518,083
387 4,518,084
454 4,518,085
485 4,518,086
632 4,518,087

CLASS 208

8 LE 4,518,478
4,518,479
11 LE 4,518,480
19 4,518,481
22 4,518,482
44 4,518,483
87 4,518,484
89 4,518,485
131 4,518,486
4,518,487
216 R 4,518,488
223 4,518,489
251 R 4,518,490

CLASS 209

166 4,518,491
4,518,492

CLASS 210

137 4,518,493
158 4,518,494
169 4,518,495
222 4,518,496
259 4,518,497
297 4,518,498
332 4,518,499
380.3 4,518,500
411 4,518,501
634 4,518,502
662 4,518,503
670 4,518,504
712 4,518,505
747 4,518,506
4,518,507
751 4,518,508

CLASS 211

13 4,518,088
118 4,518,089

CLASS 212

189 4,518,090

CLASS 219

10.55 B 4,518,839
10.67 4,518,840
56 4,518,841
69 W 4,518,842
121 LC 4,518,843
137 PS 4,518,844
216 4,518,845
271 4,518,846
365 4,518,847
388 4,518,848
492 4,518,849
505 4,518,850
549 4,518,851

CLASS 220

5 A 4,518,091
20.5 4,518,092
82 R 4,518,093
254 4,518,094
260 4,518,095
268 4,518,096
307 4,518,097

CLASS 221

15 4,518,098
30 4,518,099
225 4,518,100

CLASS 222

1 4,518,101
61 4,518,102
135 4,518,103
146.6 4,518,104
207 4,518,105
460 4,518,106

CLASS 224

215 4,518,107
314 4,518,108

CLASS 227

109 4,518,109

CLASS 228

20 4,518,110
107 4,518,111
124 4,518,112
170 4,518,113
180.1 4,518,114

CLASS 229

52 B 4,518,115

CLASS 235

381 4,518,852
449 4,518,853

CLASS 236

1 B 4,518,116

CLASS 237

53 4,518,117

CLASS 239

163 4,518,118
223 4,518,119
424 4,518,120
526 4,518,121
530 4,518,122

CLASS 241

18 4,518,123
101.7 4,518,124
141 4,518,125

CLASS 242

18 R 4,518,126
35.5 A 4,518,136
58.3 4,518,127
71.8 4,518,128
78 4,518,129
107 4,518,130
107.4 A 4,518,132
107.4 B 4,518,131
165 4,518,133
199 4,518,134
4,518,135

CLASS 244

113 4,518,137

CLASS 248

73 4,518,138
418 4,518,139
456 4,518,140
546 4,518,141
649 4,518,142

CLASS 249

61 Re.31,890
142 4,518,143

CLASS 250

201 4,518,854
4,518,855
202 4,518,856
225 4,518,857
227 4,518,858
231 SE 4,518,859
253 4,518,860
339 4,518,861
561 4,518,862
578 4,518,863
4,518,864

CLASS 251

1 A 4,518,144
5 4,518,145
28 4,518,146
121 4,518,147
122 4,518,148
144 4,518,149
306 4,518,150

CLASS 252

8.3 4,518,509
8.5 C 4,518,510
8.55 B 4,518,511
49.5 4,518,512
62 4,518,513
70 4,518,514
91 4,518,516
107 4,518,517
142 4,518,518
148 4,518,519
174.23 4,518,520
188.31 4,518,521
4,518,522
514 4,518,524

CLASS 254

93 HP 4,518,151
134.3 R 4,518,152
274 4,518,153

CLASS 260

112 B 4,518,525
112 R 4,518,526
112.5 R 4,518,527
4,518,528
245.2 R 4,518,530
245.2 T 4,518,529
245.4 4,518,531
4,518,533
404.5 4,518,532
429 R 4,518,534
438.1 4,518,535
465 D 4,518,536
504 R 4,518,537
543 P 4,518,538
549 4,518,539

CLASS 261

18 B 4,518,540
27 4,518,541
34 R 4,518,542
64 B 4,518,543
112 4,518,544

CLASS 264

1.2 4,518,545
4,518,546
4.7 4,518,547
32 4,518,548
39 4,518,549
45.9 4,518,557
46.5 4,518,550
107 4,518,551
126 4,518,552
234 4,518,553
262 4,518,554
292 4,518,555
295 4,518,556
515 4,518,558

CLASS 267

34 4,518,154

CLASS 269

60 4,518,155

CLASS 270

54 4,518,156
58 4,518,157

CLASS 271

9 4,518,158
103 4,518,159
214 4,518,160
303 4,518,161

CLASS 272

93 4,518,162
132 4,518,163

CLASS 273

148 B 4,518,164
156 4,518,165
411 4,518,166

CLASS 277

81 R 4,518,167
235 B 4,518,168

CLASS 280

6 R 4,518,169
96 4,518,170
229 4,518,176
711 4,518,171
751 4,518,172
806 4,518,173
808 4,518,174

CLASS 285

47 4,518,175
64 4,518,177

CLASS 292

8 4,518,178
166 4,518,179
201 4,518,180
4,518,181
4,518,182

CLASS 293

118 4,518,183

CLASS 294

19.1 4,518,184
67.1 4,518,185
82.24 4,518,186
88 4,518,187

CLASS 295

1 S 4,518,188
22 4,518,189
65 R 4,518,190
91 4,518,191
97 H 4,518,192
98 4,518,193
100 4,518,194
148 4,518,195
204 4,518,196
213 4,518,197

CLASS 297

229 4,518,198
248 4,518,199
284 4,518,200
316 4,518,201
452 4,518,202
456 4,518,203

CLASS 301

63 R 4,518,204

CLASS 307

200 A 4,518,865
201 4,518,866
252 B 4,518,867
306 4,518,868
350 4,518,869
356 4,518,870
443 4,518,871
448 4,518,872
451 4,518,873
467 4,518,874
473 4,518,875
475 4,518,876
490 4,518,877
520 4,518,878
530 4,518,879
577 4,518,880

CLASS 308

3 R 4,518,205
6 C 4,518,206

CLASS 310

13 4,518,881
15 4,518,882
49 4,518,884
49 R 4,518,883
52 4,518,885
71 4,518,886
328 4,518,887
334 4,518,888
357 4,518,889

CLASS 312

107.5 4,518,207
209 4,518,208

CLASS 313

346 R 4,518,890
398 4,518,891
403 4,518,892
422 Re.31,894
479 4,518,893
491 4,518,894

CLASS 315

117 4,518,895
162 4,518,896
260 4,518,897
371 4,518,898

CLASS 318

68 4,518,899
102 4,518,900
328 4,518,901
373 4,518,902
481 4,518,903
566 4,518,909
661 4,518,905
685 4,518,904
696 4,518,906
4,518,907
723 4,518,908

CLASS 324

52 4,518,911
95 4,518,912
127 4,518,913
158 F 4,518,914
158 P 4,518,910
158 R 4,518,915
173 4,518,916
207 4,518,917
208 4,518,918
228 4,518,919
319 Re.31,895

CLASS 328

14 4,518,920
151 4,518,921

CLASS 329

50 4,518,922

CLASS 330

9 4,518,923
51 4,518,924
4,518,925
253 4,518,926
284 4,518,927
297 4,518,928

CLASS 331

11 4,518,929
36 C 4,518,930
76 4,518,931
90 4,518,932
108 D 4,518,933

CLASS 332

7.51 4,518,934

CLASS 333

173 4,518,935
4,518,936

CLASS 335

229 4,518,937
262 4,518,938
4,518,939
285 4,518,940

CLASS 336

69 4,518,941
178 4,518,942

CLASS 337

68 4,518,943

CLASS 338

22 R 4,518,944

CLASS 339

14 R 4,518,209
17 LM 4,518,210
4,518,211
31 R 4,518,212
48 4,518,213
74 R 4,518,214
92 R 4,518,215
97 P 4,518,216
183 4,518,217

CLASS 340

310 A 4,518,945
326 4,518,946
347 AD 4,518,949
347 DD 4,518,947
4,518,950
347 NT 4,518,948
365 S 4,518,951
514 4,518,952
564 4,518,953
576 4,518,954
605 4,518,955
620 4,518,956
639 4,518,957
679 4,518,958
784 4,518,959
825.02 4,518,960
825.44 4,518,961
870.28 4,518,962
981 4,518,963

CLASS 343

7.3 4,518,964
742 4,518,965
754 4,518,966
771 4,518,967
802 4,518,968
819 4,518,969

CLASS 346

74.2 4,518,970
76 PH 4,518,971
136 Re.31,896
139 R 4,518,972
140 R 4,518,973
4,518,974
153.1 4,518,975
4,518,976

209 4,518,977

CLASS 350

6.8 4,518,218
96.12 4,518,219
96.20 4,518,220
96.26 4,518,221
167 4,518,222
254 4,518,223
338 4,518,225
350 R 4,518,226
422 4,518,227
427 4,518,228
454 4,518,229
511 4,518,230
516 4,518,231
606 4,518,224
620 4,518,232

CLASS 353

87 4,518,233

CLASS 354

20 4,518,234
86 4,518,235
127.1 4,518,237
270 4,518,238
286 4,518,239
312 4,518,240
319 4,518,241
403 4,518,242
418 4,518,243

CLASS 355

3 DD 4,518,245
3 FU 4,518,244
4 4,518,246
15 4,518,247
4,518,248
67 4,518,249
69 4,518,250
75 Re.31,891
4,518,251
133 4,518,252

CLASS 356

4 4,518,253
5 4,518,254
4,518,255
4,518,256
375 4,518,257
405 4,518,258
446 4,518,259

CLASS 357

24 4,518,978
30 4,518,979
4,518,980
71 4,518,981
74 4,518,982
81 4,518,983

CLASS 358

11 4,518,984
60 4,518,985
65 4,518,986
75 4,518,987
4,518,988
86 4,518,989
87 4,518,990
93 4,518,991
112 4,518,992
114 4,518,993
133 4,518,994
139 4,518,995
148 4,518,996
198 4,518,997
208 4,518,998
285 4,518,999
301 4,519,000
310 4,519,001
335 4,519,002
4,519,003
342 4,519,004

CLASS 360

65 4,519,005
76 4,519,006
77 4,519,007
79 4,519,008
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127 4,519,024

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570 4,518,344

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578 4,518,622

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CLASS 434

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513 4,518,613
516 4,518,610

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721 4,518,714

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339	4,518,389

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	343	278,854
	400	278,853
	405	278,855
D3—	35	278,856
	52	278,857
	71	278,858
		278,859
		278,860
	72	278,861
	76	278,862
D4—	108	278,863
D6—	311	278,865
	319	278,866
	327	278,867
	347	278,868
	349	278,864
	366	278,869
	369	278,870
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	381	278,872
	517	278,873
		278,874
	566	278,875
D8—	52	278,876
	71	278,877
	300	278,878
	303	278,879
	347	278,880
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	382	278,882
	399	278,883
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	403	278,887
	449	278,888
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	75	278,890
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	167	278,895
D13—	34	278,896
	40	278,897
D14—	5	278,898
	6	278,899
		278,900
	33	278,901
	52	278,902
	53	278,903
		278,904
	68	278,905
	71	278,906
	84	278,907
	100	278,908
	102	278,909
	113	278,910
		278,911
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	131	278,915
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D18—	7	278,916
D19—	52	278,918
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	150	278,922
	165	278,923
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	56	278,929
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	86	278,934
		278,935
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	93	278,940
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	4,518,390	4,518,476		4,518,107		4,518,580		4,518,344		4,517,995
	4,518,396	4,518,490		4,518,111		4,518,719		4,518,362		4,518,142
	4,518,401	4,518,493		4,518,116		4,518,728		4,518,364		4,518,301
	4,518,829	4,518,502		4,518,634		4,518,858		4,518,367	22 :	4,517,760
04 :	4,518,418	4,518,526		4,518,833		4,518,869		4,518,428		4,517,781
	4,518,661	4,518,528		4,518,847		4,518,874		4,518,488		4,517,809
	4,518,711	4,518,559		4,519,060		4,518,947		4,518,548		4,517,828
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06 :	Re.31,895	4,518,607		4,517,759		4,519,066		4,518,652		4,518,164
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	4,517,691	4,518,618		4,518,207		4,517,956		4,518,723	23 :	4,517,932
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	4,517,729	4,518,632		4,518,263		4,518,194		4,518,746		4,518,831
	4,517,731	4,518,678		4,518,281		4,518,279		4,518,795	24 :	4,517,690
	4,517,772	4,518,700		4,518,386		4,518,491		4,518,930		4,517,700
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DESIGN PATENTS

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PLANT PATENTS

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53 : 5,472

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